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ABSTRACT

A study described the education and training providers that contributed to preparing and upgrading the Pittsburgh region's work force. Providers were classified as either: (1) formal, secondary providers; (2) formal, postsecondary providers; or (3) informal, postsecondary providers, such as training provided by employers and community-based organizations. Providers were considered formal if they granted credentials to program completers and informal if they did not. In addition to institutional providers, several governmental programs, such as those of the Job Training Partnership Act (JTPA), displaced workers programs, and state-sponsored customized job training programs, were identified. In 1985-86, public schools provided the only work-related education available at the secondary level, and area vocational technical schools served about 27 percent of all vocational students. Community colleges and proprietary schools provided most of the formal postsecondary occupational education. Proprietary schools enrolled more vocational students and had larger vocational expenditures than the community colleges. On-site training by employers accounted for about half of the expenditures on work-related education in the region. Those being trained by employers tend to be those with higher levels of education and experience, rather than unskilled workers or those new to the work force. JTPA programs provided training for more than 18,000 persons in 1988. (The document contains a discussion of issues for community-based planners who seek to improve the region's work-related education system.) (CML)

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Mapping the Pittsburgh Work-Related Education System

Susan J. Bodilly, David Menefee-Libey

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THE RAND CORPORATION

Teachers College,
Columbia University

PREFACE

This Note documents a specific task of a larger project to assess the work-related education system within the Pittsburgh region and to develop strategies to adapt to future changes. The purpose of this Note is to describe the Pittsburgh area educational system and its connections to the work environment. It complements another RAND study that examined Pittsburgh's economic and demographic situation and synthesizes that initial work.[1] If this work suggests profitable areas for community-based planning, further studies will support that effort.

The study has been carried out under the auspices of the National Center on Education and Employment--a joint effort of the Teachers College, Columbia University and RAND. It is a part of a broad effort in Pittsburgh entitled "Community Based Planning for a Work-Related Education" that is being funded jointly by a grant to the Center from the Office of Education Research and Improvement of the U.S. Department of Education and a grant to RAND from the Howard Heinz Endowment of Pittsburgh.

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[1] Thomas Glennan et al., *Education, Employment, and the Economy: An Examination of Work-Related Education in Greater Pittsburgh,* The RAND Corporation, N-3007-OERI/HHE, September 1989.

SUMMARY

This Note describes or "maps" the work-related education system in the Pittsburgh region.[1] It emphasizes education and training activities that provide skills directly relevant to employment in the region. The study focuses on sub-baccalaureate education and training intended to provide entry-level work-related skills as well as education and training to upgrade skills or to support shifts to new occupations. We use work-related vocational and occupational education in the same sense interchangeably. The Note does not consider the Pittsburgh area's higher education structure that educates individuals from Pittsburgh and the nation for careers in the national labor market.

The Note identifies the most important types of providers within the work-related education system. It describes each of the provider groups in terms of the population they serve, the mission that they see themselves performing, the amount and sources of resources they expend, the relative importance of the work-related mission compared with other institutional missions, and, where possible, their relationships with other parts of the system. Some historical data are used to suggest the nature of changes in the system over its recent history. The study devotes some attention to the ways in which different parts of the system are governed and to observations by individuals interviewed concerning the functioning of the system.

The study is descriptive, not normative. It attempts to present a broad picture of all the providers that contribute to the vital task of preparing and upgrading the Pittsburgh region's workforce. It is not, however, evaluative. RAND had neither the mandate nor the resources to actively and fairly assess how well the system is functioning. Rather, this study provides essential background information to support members

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[1] Work-related training and education is used synonymously with vocational or occupational education. The emphasis is on education or training activities that are directly related to the preparation of individuals for paid or unpaid employment.

of the Pittsburgh community in their own assessments of their work-related educational system. In this way it may support strategic planning efforts related to human resource development by the Pittsburgh regional community, a task made important by the continuing changes in the region's economy.

PROVIDERS

We divide the work-related educational system in Pittsburgh into three major parts: (1) formal, secondary providers; (2) formal, postsecondary providers; and (3) informal, postsecondary providers. The distinction between secondary and postsecondary refers to both grade level and ages: Secondary includes grades nine through 12 or those under 18. The distinction between formal and informal refers to the credentials offered by providers and the regulatory processes imposed on providers. The formal, secondary providers include the public high schools and private high schools. The formal postsecondary providers include state and state-related colleges and universities, private colleges and universities, community colleges, proprietary schools, adult education programs, and apprenticeship programs. All of the above provide formal credentials. The informal, postsecondary providers include all firms offering job-related training and community-based organizations such as the United Way and the Salvation Army. Each of these three major categories of providers can be further subdivided by characteristics such as the economic sector in which they function or the attendance and admissions policies. They differ in whether they are public or private or have open or selective admissions and whether attendance is compulsory. These categories are displayed in Table S.1.

The above providers differ in the degree to which they focus on vocational education. Some are almost completely vocational in nature. The Area Vocational Technical Schools (AVTS) at the secondary level, proprietary schools, apprenticeship programs, and private training programs fall in this category. Others, including general high schools and four-year colleges, offer a wider variety of educational opportunities. The community colleges and comprehensive high schools

Table S.1

CATEGORIES OF WORK-RELATED EDUCATION PROVIDERS

Category of Provider	Provider Characteristics				
	Grade	Credential	Attendance	Sector	Admissions
Formal secondary					
Public district	9-12	Formal	Compulsory	Public	Open
Private school	9-12	Formal	Compulsory	Private	Selective
Formal, postsecondary					
State colleges and universities	13-16	Formal	Voluntary	Public	Selective
Private colleges and universities	13-16	Formal	Voluntary	Private	Selective
Community colleges	13-14	Formal	Voluntary	Public	Open
Proprietary	13-14	Formal	Voluntary	Private	Selective
Adult education	9-14	Formal	Voluntary	Public	Open
Apprenticeship	13+	Formal	Voluntary	Private	Selective
Informal, postsecondary					
Business training	13+	Informal	Voluntary	Private	Selective
Community-based organization	9+	Informal	Voluntary	Both	Means tested

offer both. Thus, the providers can be categorized as more or less work-related. A schematic representation of this is shown in Fig. S.1.

The remainder of this summary provides more information on each type of education provider. Enrollments and expenditures are for the 1985-1986 school year. Expenditures are for education and training required for a credential or credited course or provided by an employer. Thus, expenditures can include the cost of general education courses if these are required for a degree or certificate. Expenditures include instructional, administrative, and support costs. They do not include the cost of facilities, research, or community activities. Poor data limited our ability to develop consistent estimates. In particular,

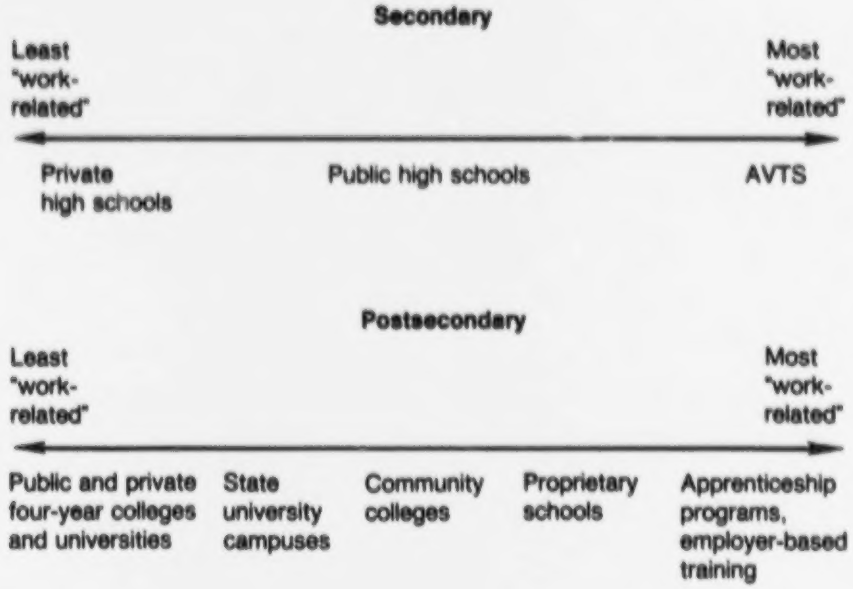
Secondary
Least "work-related"
Most "work-related"
Private high schools
Public high schools
AVTS
Postsecondary
Least "work-related"
Most "work-related"
Public and private four-year colleges and universities
State university campuses
Community colleges
Proprietary schools
Apprenticeship programs, employer-based training

Fig. S.1--Emphasis of institution on work-related education

expenditures and enrollments for proprietary schools and expenditures for private firms were estimated with scant data. The reader should refer to Appendix A for a better understanding of the strength of the estimates and data limitations.

FORMAL, SECONDARY PROVIDERS

The Pittsburgh area has 80 public school districts and 74 private high schools that provide compulsory education to those under 17. Some of the school districts are quite small compared to the central Pittsburgh district. In 1985-1986 these schools enrolled approximately 113,000 secondary students, about 63 percent of whom were located in Allegheny County. The private schools had no vocational enrollments, whereas the public schools enrolled approximately 31,000 students in 1985 in vocational programs (or 30 percent of enrollments). The secondary vocational education programs had about $182 million in program expenditures in 1985-1986, financed through federal, state, and local taxes.

The state and local governments have made strong efforts in recent years to improve the quality of education provided to all students. These programs, which have increased both general and vocational course requirements for graduation, have had strong impacts on the vocational schools. Increased state graduation requirements make it more difficult for vocational students to complete both required general education courses and vocational courses. It has become particularly difficult for students at ATVS who must spend some of their school time commuting to fulfill the stricter requirements.

FORMAL, POSTSECONDARY PROVIDERS

We identified many postsecondary providers and categorized them into subgroups as indicated below.

Four-Year Colleges and Universities

The area has six state and state-related schools and 12 private four-year colleges that focus on providing four-year liberal arts education to selected students. Although these schools together educate more than 68,000 students, they enroll very few occupationally oriented students because of their mission. We estimate that vocational enrollments at these institutions in 1985-1986 were not greater than 1,750 students or 1,300 full-time-equivalent students (FTE).

Funding sources for these schools vary. State and state-related schools receive funding primarily from the state, whereas private schools depend more on tuition and fees. Private schools tend to charge significantly higher tuitions. We estimate that the expenditures on occupationally oriented students at the sub-baccalaureate level for these schools were approximately $5 million in 1985-1986. This estimate is based on an average instructional cost per student because data did not allow us to distinguish the cost of vocational courses from nonvocational courses. The use of average institutional costs may underestimate the costs associated with vocational education.

Community Colleges

Community colleges offer two-year degrees to students who enroll under a comparatively open admissions policy. These schools have a local focus and serve those students not served by the state's other higher education institutions. The community colleges are a large source of postsecondary, work-related training in the area. Together the two community colleges located in Allegheny and Westmoreland Counties enroll approximately 21,000 students in courses for credit. We estimate that in 1985-1986 approximately 13,000 students or 8,600 FTE students were enrolled in occupationally oriented courses for credit.

The community colleges receive about one-third of their revenues from the state, one-third from local taxes, and one-third from tuition. These colleges charge significantly less than the four-year colleges per year.

We estimate that community colleges had approximately $32 million in expenditures for credited, occupational students in 1985. This estimate is based on an average instructional cost per student because data did not allow us to distinguish the cost of vocational courses from nonvocational courses. The use of average instructional costs may understimate the costs associated with vocational education.

Adult Education

The area offers adult education classes through the public high schools and community colleges. These classes are for basic education, English as a second language, and job-related skills. In 1985 approximately 5,300 students were enrolled in job-related classes. We estimate that expenditures in 1985-1986 were $4 million.

Proprietary Schools

In our discussion of proprietary schools we include all privately owned businesses that provide education and training for profit including trade, business, and proprietary schools. About 75 percent of the area's 70 schools are located in Allegheny County. Eighteen were licensed by the state in 1985 to provide specialized associate degrees.

The others provide certificates and diplomas from the particular schools.

We consider all proprietary school students to be occupationally oriented. These schools enrolled approximately 6,600 associate degree students (or 6,440 FTEs) and a total of 16,900 to 19,300 students in 1985-1986. These schools are highly dependent on tuition and fees. We estimate that the expenditures of these schools were $48 million to $79 million in 1985-1986; we use $59 million as a reasonable estimate. Instructional expenditures were between $14 million and $23 million; we use $17 million as a reasonable estimate. (Details on these estimates are contained in Appendix A. The reader is urged to review the basis for these estimates.)

Apprenticeship Programs

The Pittsburgh region has a strong union tradition that encourages many apprenticeship programs. The programs are designed to support union craftsmanship and promote self-regulation. The region has over 450 programs that enrolled approximately 3,400 apprentices in 1984. The programs are completely occupational in nature. These students earn wages as they work under the supervision of journeymen to learn skills and crafts. They are encouraged to enroll in formal courses in the community colleges, which they must pay for themselves. As such we associated no expenditures with these programs.

INFORMAL, POSTSECONDARY PROVIDERS

The data and research in the area of private sector training are not well developed. Thus, we caution the reader that the results described here are very tentative in nature.

The area has over 46,000 firms, many of which offer both formal and informal training to their employees. The nature of the data permits us to deal only with formal training. Training opportunities tend to be provided to those at managerial levels and those who have been in the workforce for longer periods of time. Entry-level workers are less likely to receive training, but given the great number of entry-level workers, substantial numbers do receive it. Training is also more likely for those in certain sectors such as public administration, services, manufacturing, and finance and insurance. We cannot estimate the number of trainees in the Pittsburgh area. However, we can estimate that the total expenditures for formal training were approximately $267 million in 1985.

SUMMARY TABLES

The above information has been encapsulated in Tables S.2 and S.3, which show numbers of providers, enrollees, and expenditures for the base year of 1985-1986. Several facts are made clear. First, the public secondary schools have a strong vocational orientation. Within the formal, postsecondary groups, the community colleges and proprietary schools are the main vocational providers. The private sector firms offer the most work-related educational opportunities--about 50 percent of expenditures.

SPECIALLY FUNDED TRAINING PROGRAMS

In addition to the above providers, several government programs constitute an important presence in the Pittsburgh work-related education community. These programs, such as the federal Job Training Partnership Act (JTPA) program and the county's Displaced Workers Program, offer educational funding for specially targeted groups. JTPA served over 18,000 disadvantaged persons from July 1987 to June 1988 and provided $12 million in funding in 1985-1986. The Displaced Workers Program served about 7,300 persons at a cost of $8.4 million in 1987. Additional funding of $1.1 million will be available from state and federal sources in 1988 and 1989. These programs are means tested; that is, only those meeting criteria concerning socioeconomic status are eligible. Many of the participants in these programs as well as the expense of their education have been included in the estimates of enrollment and expenditures of the providers already discussed. These programs do not provide the training themselves but arrange for other providers to do so with reimbursement of funds. Thus, although not

Table S.2

ESTIMATES OF PROVIDERS AND ENROLLMENTS, 1985-1986

	Number of Providers	Total Enrollments	Voc. Ed. Enrollments
Formal, secondary			
Public	80	101,900	31,000
Private	74	11,300	0
AVTS[a]	12	(8,500)	(8,500)
Formal, postsecondary			
State	6	38,600	1,300
Private	12	28,800	450
Community college	2	21,700	13,000
Proprietary	70	16,900-19,300	16,900-19,300
Apprentice	450	3,400	3,400
Adult	n.a.[b]	n.a.	5,300
Informal, postsecondary			
Private firm	n.a.	n.a.	n.a.

[a] AVTS students attend the public high schools and should be counted separately.

[b] Not available or not applicable.

considered formal providers, these programs allow many disadvantaged persons to obtain work-related education.

Table S.3

EXPENDITURES ON WORK-RELATED EDUCATION PROGRAMS IN THE PITTSBURGH REGION (1985-1986)[a]

	Expenditures $Million	Percent of Total Expenditures
Formal, secondary	(182)	(33)
Public	182	33
Private	0	0
Formal, postsecondary	(100)	(18)
State	4	1
Private	1	0
Community college	32	6
Proprietary[b]	59	11
Apprentice	0	0
Adult	4	1
Informal, postsecondary	(267)	(49)
Private firm	267	49
Total	549	100

[a] Includes expenditures on all activities related to receiving a credential or required by a firm. For the formal providers it includes the cost associated with vocational students enrolled in general or academic courses.

[b] Based on lower bound of enrollment estimate of 16,900 and expenditures for certificate and diploma programs at three-fourths that for associate degree programs.

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We acknowledge the contributions to this study made by those in the U.S. Department of Education and in the Pittsburgh regional community, especially: the Howard Heinz Endowment; the Allegheny Conference; the Pittsburgh High-Technology Council; and administrators of the local JTPA programs, city and county schools, proprietary schools, colleges, and universities. We would especially like to thank our colleagues at the University of Pittsburgh and Carnegie-Mellon University for their assistance and for offering access to their own research. In addition, we would like to thank those at the state level for their contributions, including officials from the Departments of Education, Commerce, and Labor. The Pennsylvania Department of Education, Division of Data Services, was especially helpful. Our colleagues Thomas K. Glennan, Anthony Pascal, Timothy Webb, and James Harvey reviewed this Note and suggested numerous improvements. Excellent research support was provided by Luetta Pope, Patrick Murphy, Linda Tanner, and Susan McElroy.

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I. INTRODUCTION

Pittsburgh, like many other older U.S. cities, has suffered in the 1970s and 1980s as its economy has moved away from heavy industry toward a more service-oriented base. Employment levels have stagnated and the population has declined.[1] Leaders in the region are anxious to reverse these trends and have made strong efforts to promote regional economic development.[2] But economic development depends upon a capable and adaptable workforce. This, in turn, depends on the performance of the education and training system in the region.

In support of a potential community effort at assessment of changes required in the work-related education system to meet future demands, RAND began an information gathering and analysis project. Specific research tasks included: interviews with community spokespersons; analysis of regional demographic and economic trends; and mapping of the regional work-related education system.

In this Note we address the latter task: mapping the Pittsburgh work-related education system. The Note is intended for Pittsburgh audiences: community leaders and concerned citizens who wish to understand, consider, and develop strategies for promoting the economic development of Pittsburgh through improvements in the work-related education system. It provides an overview and relevant information about the different institutions involved in providing work-related education and identifies issues that a strategic examination of the system might wish to consider. In particular it: identifies the institutions that provide work-related education; describes their missions and the public policies that affect them; describes their enrollments and student characteristics; examines resources available to them; shows trends in the above over time, reviews some indicators of their performance; and discusses recent steps taken to improve performance.

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[1] See for instance Thierry Noyelle, *Services and the New Economy: Toward a New Labor Market Segmentation*, National Center on Education and Employment, Occasional Paper 5, April 1988; Robert Reich, *Education and the Economy*, National Education Association, 1988; Thomas Glennan et al., *Education, Employment, and the Economy: An Examination of Work-Related Education in Greater Pittsburgh*, The RAND Corporation, N-3007-OERI/HHE, August 1989.

[2] Ralph Bangs and Vijai Singh, *The State of the Region: Economic, Demographic, and Social Trends in Southwestern Pennsylvania*, University of Pittsburgh, Pittsburgh, PA, 1988.

The Note uses three sources of information: statistical data from the national, state, and local governments; interviews with local leaders, and publications on issues facing the educational community and the region. Statistical data are used to describe the system, the institutions involved in providing education, their clients, resources, and system outputs. Interviews and written documents are used to identify issues and to understand special features of the system.

We note that data on vocational education remain poorly developed. The data provided in this Note tend to be from state data sources to ensure some consistency of definition. Despite strong state efforts to develop sources, we found that data limits constrained much of the analysis. A secondary product of this study is suggestions as to which data sources require further development.

Where possible we compare Pittsburgh, the region, the state, and the nation. This information may provide some additional insight into the trends noted. However, we note that no standards exist in the educational and work communities upon which to base judgments about the performance of Pittsburgh compared to other locations or the general performance of the nation.

DEFINING THE REGIONAL WORK-RELATED SYSTEM

We used the term work-related education system. System is defined by Webster as regularly interacting or interdependent groups forming a united whole.[3] The term usually refers to different subcomponents within a single organization. But, it can also refer to a group of distinct organizations that interrelate and are in some way interdependent.* In this latter sense, the many clients of the educational and training system--students, parents, businesses--and the many providers of education--public and private schools and businesses--form a system. They interact with each other regularly and are in some ways interdependent.

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[3] Webster's Ninth Collegiate dictionary.

The use of the term system, however, does not imply a systematic approach to the provision of work-related education marked by methodical, thorough procedures and plans. It is not centrally designed or managed. Its components have grown irregularly and, perhaps, out of step with one another largely in response to periodic legislation or demographic and economic shifts.

The system, instead, is very loosely coupled. Changes in one institution or its client base will tend not to directly or immediately impinge on the other institutions of the system. The connections between the different organizations are indirect, weak, and often not well understood. Loose coupling is not a pejorative term; it is merely descriptive. Systems may have many legitimate reasons for maintaining loose coupling, including the positive results that the system may be more flexible in a changing environment and less prone to catastrophic failure than one whose interactions are closely interrelated.

We also use the term regional, which relates to our examination of the education system over the four counties that make up the Pittsburgh Primary Metropolitan Statistical Area (PMSA): Allegheny, Fayette, Washington, and Westmoreland. We chose not to focus solely on the city of Pittsburgh because the economic future of the city cannot be separated from that of the region. The market for labor is regional in nature. Thus, we provide information on the region as well as specific information on Allegheny County and the city of Pittsburgh.

We use the term work-related education system to identify that part of the broader education system that is designed to provide education and training intended to directly improve an individual's access to and performance in the workplace. We are most interested in those components that distinctly serve the local labor market. Thus, we focus our attention on nonbaccalaureate vocational and occupational programs that prepare people for entry-level jobs.[5] We are also interested in remedial and occupational programs for displaced workers, dropouts, or other disadvantaged individuals. In addition, we examine continuing education that helps people upgrade skills or develop new capabilities. We generally exclude education and training activities that prepare people to compete in the national labor market or, for that matter, serve people from outside the area. Four-year programs leading to baccalaureate degrees and formal graduate programs fall in this category. Thus, we initially discuss the entire education system including the secondary level, higher education, and specific job training. However, for each category of institution our focus will rapidly, if somewhat arbitrarily, narrow to specific information about vocational components.

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*This latter description can also be called a field or an environment.

OVERVIEW OF THE WORK-RELATED EDUCATION SYSTEM

Many public and private institutions provide work-related education in the area. Together they present a complex array of institutions with different purposes, clients, and vocational emphasis.

We categorized these providers into a typology that defines the limit of the system we consider, provides structure to the system, and highlights the different missions and clients of each institution. We note that some important providers are excluded, such as parents in the home; this exclusion does not mean that these providers are less important. We based the typology on five characteristics that define the niches different types of institutions fill. These characteristics are described below.

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[5] Vocational education is defined by the state as "programs under public supervision and control which provide an organized process of learning experiences designed to develop skills, knowledge, attitudes, work habits, and leadership skills for entry into and advancement within various levels of employment in occupational areas of agriculture, business, marketing and distribution, health, home economics, and trade and industry--as classified by the U.S. Department of Education." Pennsylvania Department of Education, *Regulations and Standards for Vocational Education*, Bureau of Adult Education, 1986, p. 3. The Carl Perkins Vocational Education Act, Section 521(31) limits vocational education to those programs below a baccalaureate or advanced degree.

Grade Level--The institutions educate and train students at different grade levels and ages. We use this as a fundamental category to divide all the providers into two groups: those who focus on the secondary level and those who focus on the postsecondary level.

Credential--Institutions may choose to provide formal credentials, such as diplomas or degrees, that are well recognized and subject them to oversight from government, educational associations, or formal labor organizations. This regulation imposes formal procedures, standards, and processes on the institutions. We use this characteristic as a second fundamental category to divide all the providers into two groups: those who do provide a credential, usually publically recognized, which we categorize as part of the formal education and training system, and those who do not which we categorize as part of the informal system.

Economic Sector--Some institutions, such as the public school districts and state and local colleges, are public entities having community well-being as an important goal. This goal affects the types of students who attend, political responsiveness, and admissions policies. On the other hand, some institutions, such as private high schools, private colleges, and business training programs, belong to the private sector and are less motivated by public purposes.

Attendance--Participation in some institutions is compulsory by state law. All children must attend high school to receive a basic education in Pennsylvania until the age of 17. Thereafter, participation is voluntary. For all other institutions participation is voluntary. Each participant, at his or her own motivation, must seek out further educational opportunities and choose which institution to attend and which career path to follow.

Admissions Policy--Institutions differ importantly in their admissions policies. Admissions policies are usually related to the institution's economic sector. Institutions that serve the community, such as the public school districts and community colleges, tend to have open admissions, which can lead to resource allocation conflicts.

Private institutions, however, tend to have more exclusive admissions policies which result in less demanding or conflicting goals. This contrast has been stated well elsewhere in defense of the open door policy of community colleges, "While more elitist institutions may define excellence as exclusion, community colleges have sought excellence in service to the many."[6]

We assessed each provider according to the above characteristics and assigned providers into general categories of level of education and formal or informal credentialing. This allowed for three major categories of providers: formal, secondary providers; formal, post secondary; and informal, postsecondary. There are no providers in the informal, postsecondary category. These categories are displayed in Table 1.

Besides the above providers, another group of organizations is important in encouraging work-related education: government agencies with programs that fund training. The agencies do not provide education services; they fund other providers through established programs. Finally, community-based organizations, such as the United Way or the Salvation Army, provide work-related education. Resource contraints have prevented detailed examination of these providers although we will describe the Job Training Partnership program, which provides them a significant part of their support for these activities.

ORGANIZATION OF THE NOTE

The Note is organized by institutional characteristics as shown in Table 1. Section II describes the formal, secondary institutions including public school districts and private high schools. It begins with a general description of the regional system and then focuses on those parts that serve the vocational education needs of students. Section III examines the formal, postsecondary institutions including colleges and universities, proprietary schools, and apprenticeship

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[6] Commission on the Future of Community Colleges, *Building Communities: A Vision for a New Century*, American Association of Community and Junior Colleges, Washington, D.C., 1988.

Table 1

CHARACTERISTICS OF WORK-RELATED EDUCATION PROVIDERS

Category of Provider	Grade	Credential	Attendance	Sector	Admissions
Formal secondary					
Public district	9-12	Formal	Compulsory	Public	Open
Private school	9-12	Formal	Compulsory	Private	Selective
Formal, postsecondary					
State colleges and universities	13-16	Formal	Voluntary	Public	Selective
Private colleges and universities	13-16	Formal	Voluntary	Private	Selective
Community colleges	13-14	Formal	Voluntary	Public	Open
Proprietary	13-14	Formal	Voluntary	Private	Selective
Adult education	9-14	Formal	Voluntary	Public	Open
Apprenticeship	13+	Formal	Voluntary	Private	Selective
Informal, postsecondary					
Business training	13+	Informal	Voluntary	Private	Selective
Community based organizations	9+	Informal	Voluntary	Both	Means tested

programs.[7] The discussion focuses on those components that are predominantly involved in providing specific job-related skills. Section IV describes the informal, postsecondary institutions. The section is brief of necessity; data on these providers are scant. Section V discusses government-funded training programs in the Pittsburgh region. Finally, Sec. VI summarizes the findings and highlights potential issues uncovered during the research.

Within the Note we estimate enrollments and vocational education expenditures for the different types of providers. Readers wishing to determine our estimation methods should refer to Appendix A, which shows the calculations and sources used for these estimates. Appendix B lists the higher education schools in the area.

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[7] We use the term proprietary to include privately owned trade and business schools.

II. SECONDARY, FORMAL EDUCATION

This section examines the secondary-level education provided in the Pittsburgh region. We classify these providers as part of the formal educational system because the credentialing process and government regulation impose formal standards for planning, course offerings, and graduation on the institutions and students. This section provides a brief overview of the entire system before focusing on vocational education.

OVERVIEW OF SECONDARY SYSTEM

The Pittsburgh region has 80 public school districts and 74 private schools that provide secondary education to over 110,000 children. These compulsory institutions have several missions: (1) to provide students with a basic understanding of their civil responsibilities; (2) to develop students' basic skills so that they can pursue productive employment and be self-sufficient; and (3) to transmit cultural and moral norms to the students. The private schools may have additional religious missions.

Public Institutions

The public school districts are government entities authorized by the state to provide free education to all children of school age. The public schools, like other democratic entities, must ensure equal access and equal opportunity. They have a specific mission to provide an education to all students despite the advantages or disadvantages of any individual. In addition, their mission is tied to goals of the community that they were created to serve. Thus, community goals are intertwined with educational goals.

The public, compulsory nature of the schools has resulted in the adoption of an implicit set of goals. These goals were implied or explicitly stated by all educational leaders and officers we interviewed and are no different than those found in most public educational districts throughout the United States. They can be characterized as follows.

- Provide at least a minimum standard of education and work toward an excellent standard for all.
- Prevent dropouts and encourage completion of a high school diploma.
- Provide the special resources needed by disabled children, those at risk of failure because of socioeconomic pressures, and gifted students.
- Provide the varied learning experiences necessary to promote the educational and employment goals of all students, i.e., vocational and academic curriculum.

The implicit adoption of these goals has had several important implications for any examination of the work-related education system. First, many conflicting points of views on efforts to improve system performance can be traced back to the relative weight the viewholder puts on these goals. Second, attempts to meet all of these goals simultaneously has led to resource and graduation requirements within the public school districts that affect the ability of students to obtain a vocational education. We will explore this in later sections.

The Pennsylvania education system has a long history of local control. Although authorized by the state and operated under state codes and minimum standards, in fact, the local school districts have a great deal of autonomy. In Pennsylvania, the state mandates standards for graduation and certification and requires certain years of attendance. The districts, however, have tax-raising authority and control the hiring and firing of employees, the general curriculum offered with approval by the state, and the level of expenditures.

Unlike many western and southern states, Pennsylvania has not consolidated its school districts to the level of one per county. Thus, although the city of Pittsburgh has one school district, Allegheny County has 43 including Pittsburgh, and the four-county PMSA has 80.

In 1971, the state created the concept of Intermediate Units (IU) and 29 now operate in the state to provide services to local educational agencies (LEAs). The city of Pittsburgh and Allegheny County each have one IU and the surrounding area contains four. The IUs are governed by their participating districts and provide only those services requested by the districts. Their funding comes primarily from these districts with some small percentage of funds coming directly from the state. The services provided by the IU tend to be special education, regional vocational education, demonstration programs, and analytical capability. In the city of Pittsburgh the IU provides all systemwide services such as professional development and teacher induction not covered by other divisions.

Private Schools

Within the Pittsburgh region the mission of compulsory secondary education was also served by 74 private schools, most affiliated with churches or religious organizations. Although many of the schools are not Roman Catholic, the 16 Catholic high schools enroll a large majority of private secondary students in the region (73 percent).[1] To receive high school diplomas, private secondary-school students in the region must complete the same state curriculum requirements as their public school counterparts.

Beyond these broad public mandates, however, the diversity of the private schools' governing structures makes generalizations almost impossible. Even the Catholic schools have several systems: some are run by the Diocese of Pittsburgh, some by individual parishes within the Diocese, some by independent orders of religious teaching communities. In virtually all cases, however, the central (nonreligious) educational mission of these private schools is to prepare their students for college through academically oriented curricula.

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[1] Official Directory, Catholic Schools Office, Diocese of Pittsburgh, 1985-1986.

ENROLLMENTS

Public school enrollments in 1987 were spread over 80 districts that varied tremendously by size. The push for local autonomy in the state allowed the growth of districts in the area, some of them quite small. The counties surrounding Pittsburgh tend to be comparatively sparsely populated and divided into small public school districts. Twenty-five districts have 2,000 or fewer students and 62 have fewer than 4,000 students. In contrast, the Pittsburgh school system is consolidated and densely populated with approximately 40,000 students. Figure 1 shows the enrollment in the area by district size.

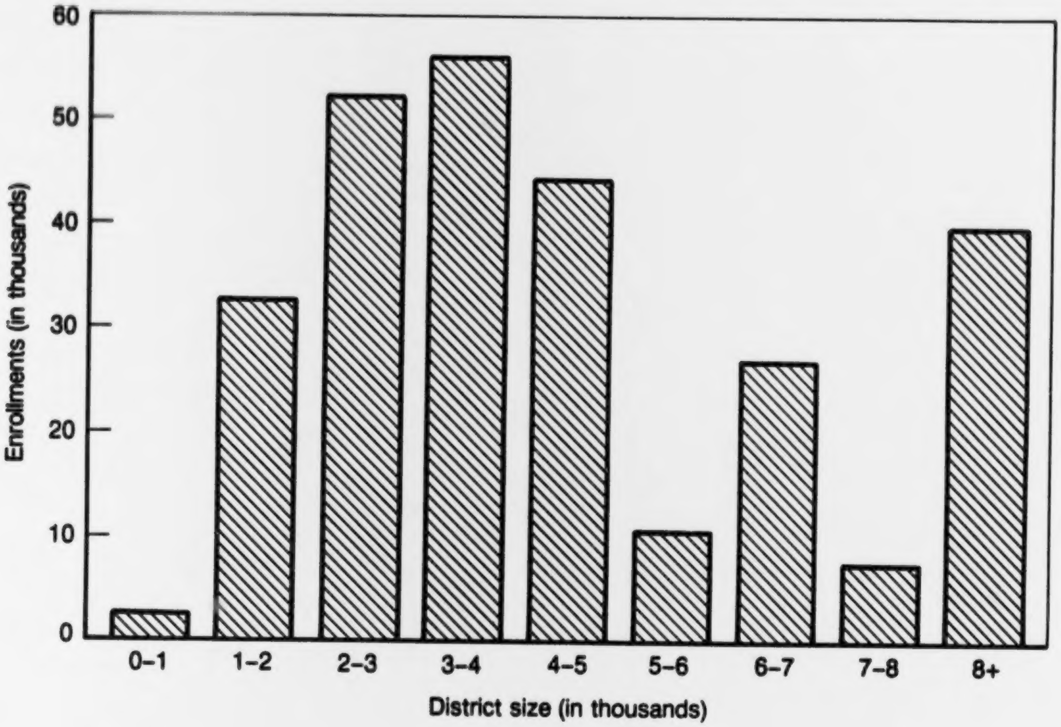

Fig. 1--Distribution of students and districts by size of school district (K-12, 1987)

Total Enrollments

The region accounts for about 17 percent of the public school enrollment in the state with 280,000 children enrolled in grades K-12 in 1987.[2] Although the region covers four counties, about 60 percent of the students (166,200) are in Allegheny County. The city of Pittsburgh has about 15 percent of the region's school age enrollment (39,900) and about 24 percent of Allegheny county's school age enrollment. Fayette has 8 percent (23,900), Washington has 11 percent (32,000), and Westmoreland has 21 percent (58,000).

The region has experienced a decline in enrollments over the last 13 years. This is partly because of the national trend of falling school age enrollments as a result of smaller family sizes. National enrollments in elementary and secondary public schools fell from 45,429,000 in fall 1973 to 39,513,000 in fall 1985, a 13 percent decrease.[3] This trend, however, has been exacerbated in Pennsylvania by migration out of state. Pennsylvania enrollments fell by 26 percent between 1975 and 1987. Public school enrollments in Allegheny County fell 38.6 percent from the fall 1975 to fall 1987. Pittsburgh city enrollments fell 36.5 percent over the same period. Fayette, Washington, and Westmoreland have not had quite as precipitous a decline as Allegheny. Their school age populations fell from 25 percent to 30 percent in the same time period.[4]

Secondary Enrollments

Altogether, the region had approximately 102,000 secondary public students in 1985-1986 or 18 percent of the state total. Allegheny County enrolls about 60 percent of the regional total. These figures are shown in Table 2.

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[2] Pennsylvania Department of Education, *Summary of Enrollments In Public Schools in Pennsylvania, 1987-88*, April 1988.

[3] Center for Education Statistics, *Digest of Education Statistics, 1987*, p. 37.

[4] Pennsylvania Department of Education, *Summary of Enrollments In Public Schools in Pennsylvania, 1985-86*, and *Summary of Enrollments in Public Schools of Pennsylvania, Fall 1975.*

Table 2

TRENDS IN PUBLIC AND PRIVATE SECONDARY ENROLLMENTS[a]

Area	Private 1975-76	Public 1975-76	Percent Private	Private 1985-86	Public 1985-86	Percent Private
Allegheny	12,471	99,735	11.1	9,109	61,816	12.8
Fayette	502	10,129	4.7	479	7,740	5.8
Washington	753	14,779	4.8	687	11,357	5.7
Westmoreland	852	28,547	2.9	1,057	20,948	4.8
Region	14,478	153,190	8.6	11,332	101,861	10.0
State	115,020	735,864	13.5	94,721	562,052	14.4

SOURCES: Pennsylvania Department of Education, *A Listing of Pennsylvania Nonpublic Schools Having Secondary Enrollments and a Summary of Enrollments in Pennsylvania Public Schools*, 1975 and 1985.

[a] These enrollments do not include ungraded students, which might add 1 to 3 percent to enrollments.

The private secondary schools enroll fewer students. The region has approximately 11,000 private secondary students who constitute less than 10 percent of total secondary enrollments. However, the percentage of private school enrollments compared to total enrollments varies by county. Over 12 percent of Allegheny County secondary students are enrolled in private schools, whereas private secondary enrollments in the other counties are 5 to 6 percent of the total secondary enrollment. These figures are shown in Table 2.

In the ten years between 1975 and 1985, private secondary schools lost enrollments more slowly than their public counterparts. Private school enrollments in the region declined by 22 percent from 1975 to 1985, whereas public school enrollments declined by 34 percent. Enrollments in Catholic schools declined more steeply in subsequent years (almost 25 percent between 1985-1986 and 1988-1989), so the distinction may be waning. The reasons for this decline are unknown, but Catholic school officials stated it may be due to stronger recruiting by public schools to maintain their enrollments.

CHARACTERISTICS OF ENROLLEES

Regionally, whites account for 89 percent of enrollments, and minorities account for 11 percent. However, the racial characteristics of enrollments vary by county within the region.[5]

Black students make up a significant percentage of the school age population--10 percent of the regional enrollment. The black student population is heavily concentrated in the central city of Pittsburgh, which had a black high school population of about 46 percent in 1985. The surrounding parts of Allegheny County and other counties have relatively small black student populations (7 percent or less) with Westmoreland County having about 2 percent. However, the black student populations in the surrounding counties tends to be concentrated in three areas: McKeesport, Alquippa, and Clairton.

Whites make up 92 to 97 percent of enrollments in the region outside of Pittsburgh. Within the city they make up 53 percent of enrollments.

Although nationally the population of Asian and Hispanic students has increased, this trend appears to have passed by the Pittsburgh region. The Asian, Hispanic, or American Indian high school enrollments account for 1 percent or less of the enrollments in all of the counties in the region.

The state does not gather demographic data on private school enrollees and data were not available from the Catholic schools. We, therefore, cannot report the racial composition of these schools.

EDUCATIONAL RESOURCES

Expenditures per pupil also vary across the region. The city of Pittsburgh spends considerably more on an average daily membership basis than the surrounding counties, especially Fayette.[6] As compared to the state and national averages, both Allegheny County and the city of

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[5] Pennsylvania Department of Education, *Summary of Enrollments In Public Schools in Pennsylvania, 1985-86*, 1986.

[6] Average daily membership equals the aggregate number of school days for all children on active rolls divided by the number of days of school.

Pittsburgh spend more, whereas the other counties in the region spend less. Expenditures for secondary students are shown in Table 3.[7]

The state spending level has changed over time in accordance with national education expenditure trends. Between 1969-1970 and 1983-1984 the national average expenditure per pupil in constant dollars rose from $2,285 to $3,297, a 44 percent increase. In Pennsylvania during the same years the state average expenditure rose from $2,469 to $3,790 in

Table 3

ESTIMATED SECONDARY-LEVEL EXPENDITURES PER STUDENT

($ 1985-1986)

Area	Instructional[a] Expenditures/ Secondary Student	Current[a] Expenditures/ Secondary Student	Total
Allegheny	3,132	5,045	758,445,100
Pittsburgh	3,618	5,987	210,709,726
Allegheny without Pittsburgh	2,985	4,760	511,119,195
Fayette	2,288	3,394	72,664,541
Washington	2,261	3,565	103,791,631
Westmoreland	2,364	3,689	187,929,870
Nation[b]	n.a.	3,749	n.a.

SOURCES: Pennsylvania Department of Education, *Selected Expenditure Data for Pennsylvania Schools 1985-86*. Expenditures have been weighted by 1.36 to account for the higher level of expenditures for students in grades 7-12 as noted in the data source and inflated by 1.07 from 1984 dollars. Center for Education Statistics, *Digest of Education Statistics 1987*.

[a] Definitions of expenditure terms are given in Appendix A.

[b] The national average is based on 1984-1985 data escalated by 8.7 percent.

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[7] Expenditure figures include current and instructional costs. Instructional expenditures are those attributable to the direct interaction between teachers and students for a program of study. Current expenditure equals instructional expenditure plus support, administrative, and noninstructional services. Neither contain capital outlays or debt service. See Appendix A for details.

constant dollars, a 54 percent increase. Expenditures per pupil in Pennsylvania have remained above the national average and increased in that period slightly more than they did nationally.[8] Current expenditures in 1984-1985 were $3,449 nationally and $3,648 in Pennsylvania. This higher expenditure growth may be due to the larger declines in population in Pennsylvania which would, at least temporarily, result in a higher per pupil expenditure.

Public school resources come from all three levels of government. The largest source of funds is local community taxes, 61 percent of revenues for the region. State taxes are the second largest source of funds--35 percent--and the federal government the smallest source of funds--3 percent. The state and the region depend relatively more on local funds than the national average. These figures are shown in Table 4.

A regional view, however, masks major revenue source differences at the county level. For instance, Fayette County is relatively highly dependent on state sources of funds (62 percent), whereas Allegheny County is the least dependent of the four on state sources (27 percent).

Variation also exists at the district level. For instance, in Allegheny County the Quaker Valley school district receives 87.8 percent of its resources from local funds; 11.5 percent of its resources come from the state. In contrast, South Allegheny school district receives 51.3 percent of its revenues from local funds and 46.4 percent from the state.[9]

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[8] Center for Education Statistics, *Digest of Education Statistics, 1987*, p. 113.

[9] Local tax capability measured by equalized mills also varies among the region's school districts. Sto-Rox school district in Allegheny County taxes itself at the rate of 30.7 equalized mills, ranking number 10 in the state in terms of local tax effort. Albert Gallatin school district in Fayette County taxes itself at 16.4 equalized mills, ranking number 439 in the state--a very low tax effort. Equalized mills are school taxes collected by the district divided by the total market value of property in the district. Based on analysis of Pennsylvania Department of Education, *Schools Today: Public Schools Financial Statistics Report, 1980-81* and *Selected Revenue Data and Equalized Mills for Pennsylvania Public Schools, 1985-86*.

Table 4

SOURCES OF REVENUES FOR PUBLIC SCHOOLS, K-12, 1985-1986

(in $ 100,000)

	Local		State		Federal		
Area	$	%	$	%	$	%	Total
Allegheny	566.5	67.2	24.6	29.2	25.7	3.0	843.2
Pittsburgh	151.5	60.0	85.0	33.6	15.6	6.2	252.7
Allegheny without Pittsburgh	415.0	70.2	161.0	27.2	10.1	1.7	590.5
Fayette	25.8	32.8	48.7	62.0	4.0	5.0	78.6
Washington	61.6	52.3	52.3	44.4	2.9	2.4	117.8
Westmoreland	110.0	54.2	88.0	43.3	4.6	2.3	203.2
Region	763.9	61.5	435.0	35.0	36.2	2.9	1,242.2
State	3,724.1	56.4	2,518.0	38.1	224.8	3.4	6,602.9
Nation (1984-1985)	--	44.7	--	48.8	--	6.6	--

SOURCES: Pennsylvania Department of Education, *Selected Revenue Data and Equalized Mills for Pennsylvania Public Schools 1985-1986*, and Center for Education Statistics, *Digest of Education Statistics, 1987*, p. 108.

The variation in the sources of revenues can, at least in part, be explained by the strong local control exhibited in the state. Differences in the ability and willingness of districts to raise taxes cause large variation in local revenues per pupil. These variations are not dampened by the state funding sources. Although the state uses an equalization formula for dispersing funds, the low relative level of state funds compared to all funds reduces the impact of the state funds in equalizing disparities.

The region's relative reliance on different sources of revenues has been stable for the last few years. There has been a slight shift toward increased reliance on local funds and away from reliance on federal and state funds. The maximum shift of three percentage points toward local funds was in Allegheny County. Fayette County is alone in having had a slight shift away from local revenue sources of 1.2 percent. It is now more dependent on the state for revenues than in 1980. This shift implies that some districts within the county face poor economic conditions, which leaves them unable to raise local education funds.[10]

Small districts may be at a disadvantage in attracting resources and personnel compared to larger, better funded districts. In interviews, officials from some of the Mon Valley districts stated that being located near a city that has strong support for education has its drawbacks. The smaller districts have difficulty attracting well qualified teachers because these teachers prefer employment at better paying jobs in the city of Pittsburgh. Furthermore, large grants, like those of the Casey Foundation, draw attention away from problems in the more rural school districts and, while boosting morale in the schools that receive grants, reduce it in those that do not receive grants.

The private schools in the area are decentralized and not subject to the same level of reporting as public schools, making their revenues and expenditures difficult to estimate. They generally spend less per student than their public counterparts. Because they raise virtually all their revenues through tuition, the tuition levels approximate their per pupil expenditures. Tuition in Catholic schools in 1985-1986 averaged just over $2,000 per student, ranging from $1,250 to almost $2,500. Tuition in private schools has generally increased more slowly than per pupil expenditures in the region's public schools.[11]

VOCATIONAL EDUCATION AT THE SECONDARY LEVEL

Providers

Public institutions use two types of arrangements to provide secondary vocational education in the Pittsburgh region: comprehensive high schools, or general high schools in combination with Area Vocational-Technical Schools (AVTS) or IUs.

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[10] For example, the Clairton district was recently forced to apply to the state for additional funds to prevent schools closures.

[11] Interview with Anna Marie Catanzaro, Diocesan Secondary Educational Consultant, Catholic Schools Office, Diocese of Pittsburgh.

Comprehensive high schools offer a full spectrum of courses that include both academic and vocational curricula. Schools do not specialize as either academic or vocational. The city of Pittsburgh uses the comprehensive high school approach. Each city comprehensive high school offers its own selection of programs. Students may travel between schools to obtain the particular courses they desire.

Regular or general high schools, used by other districts outside of the city, provide an academic curriculum and send students interested in a vocational curriculum to specialized vocational education schools for half days. The sending schools provide basic and academic courses as well as some common or less expensive vocational courses. Specialized vocational schools offer more sophisticated or more capital intensive vocational courses than the general high school.

An AVTS is a specialized vocational school created by a pool of districts or by an IU to provide 11th- and 12th-grade students with specific vocational curricula. AVTSs are a common institutional form throughout the United States. The AVTSs were established in Pennsylvania over a ten-year period beginning in the mid-1960s, when secondary enrollments were high but vocational training was becoming increasingly specialized and expensive. To enable economies of scale, clusters of smaller school districts set up joint vocational schools.

The AVTSs are financed jointly by the sending districts, largely on a per pupil basis. Both finance and governance of the schools are handled by joint operating committees that include members from the school boards of each of the sending districts. In the cases where intermediate units run the AVTSs the relationship is more indirect, but the effect is the same.

Allegheny County and the surrounding districts have general high schools with specialized AVTS and IU units. Allegheny County has four AVTSs run by school districts and one AVTS program run by the IU for a total of five AVTSs. Fayette and Washington each have two AVTSs; Westmoreland has three.

Private high schools tend to prepare students for college education. None of the Catholic schools have vocational programs, and the schools send very few of their students to public schools for vocational training. At one time about 5 percent of the vocational education attendees in the Pittsburgh city schools came from the Catholic schools. This attendance has fallen and officials estimate it to be less than 100 now. Thus, private schools are not really providers of vocational education and will not be discussed further.

Vocational Education Enrollments

The region has a strong vocational education component at the secondary level. Enrollments include only those students signed up for a full vocational education program. To be termed a vocational education student under the state of Pennsylvania guideline requires a student to sign up for an entire program that can take one to four years to complete. On average the programs take 720 hours over a two-year period, but there is a great deal of variation. A four-year sequence requires 1,320 course hours in vocational education and a one-year sequence undertaken in the senior year requires 720 hours.[12] The student who successfully completes the program receives a high school diploma that specifies the vocational nature of the curriculum. Students taking a single elective vocational course, say typing or technology education, are not included as vocational education students according to state definitions of "a vocational program."

In 1985 about 31,000 high school students in the region or 29 percent were enrolled in state defined vocational education programs. In Pittsburgh about 42 percent of the students were enrolled in vocational programs. However, many more students may be enrolled in single, elective vocational courses. The five area vocational schools of Allegheny county served approximately 12 percent of the high school student population.[13] Table 5 shows the secondary vocational program enrollments in the region by county as compared to all enrollments.

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[12] Pennsylvania Department of Education, *Regulations and Standards for Vocational Education*, Bureau of Vocational and Adult Education, 1986.

[13] Allegheny County Regional Planning Unit, *A Long Range Plan, Part I--Technical Report*, April 1988, p. 11.

Table 5

PUBLIC VOCATIONAL EDUCATION PROGRAM ENROLLMENT, 1986-1987

Area	Enrollment 9-12[a] A	Enrollment Voc. Ed.[b] 9-12 B	Percent C
Allegheny	62,058	17,839	29
Pittsburgh	13,670	5,794	42
Allegheny without Pittsburgh	48,388	12,045	25
Fayette	8,260	3,344	40
Washington	11,421	2,893	25
Westmoreland	21,152	6,187	29
Region	102,891	30,263	29
State	566,644	164,525	29

SOURCES: Column A = *Listing of Pennsylvania Public Schools Having Secondary Enrollments 1986-87*, Pennsylvania Department of Education, Division of Data Services, August 1987. Column B = *Vocational Education Management Information System, 1986-1987*, Pennsylvania Department of Education, Division of Data Services.

[a] This includes prorated share of ungraded students.

[b] This includes only those students who are enrolled in a complete vocational education program with the intention of receiving a high school vocational educational diploma. Students from general or academic tracks who take an occasional vocational educational course are not included.

Although vocational enrollments account for a substantial percentage of all enrollments, vocational enrollments have been declining at a faster rate than regular enrollments. At the state level regular enrollments for grades 10-12 fell by 14.2 percent from 1980-1981 to 1985-1986 and vocational enrollments fell by 27.7 percent.

Program enrollments vary by vocational field. The largest concentrations of program enrollments are in home economics courses which constitute about 40 percent of the region's vocational enrollments. Trade and industry courses make up 26 percent of regional enrollments and business courses make up 21 percent. Health, marketing and distribution, agriculture, and other courses apparently hold less interest for students or are not offered. The proportion of students electing a particular field does not vary by county. The above information is encapsulated in Table 6 which shows the percent of total vocational program enrollments in each field according to state definitions.

Enrollments do vary by gender. Approximately 60 percent of vocational education enrollments are female and 40 percent are male. Nationally, enrollments are evenly balanced between male and female.[14]

Table 6

SECONDARY VOCATIONAL EDUCATION ENROLLMENTS BY PROGRAM, 1986-1987

(Percentage of total vocational education enrollments)

Area	Agri. %	Bus. %	Hlth. %	Market. %	Occupational Home Ec. %	Consumer Home-making %	Trade/ Ind. %	Other %
Allegheny	0	20	3	8	8	35	24	2
Pittsburgh	0	21	2	7	n.a.	n.a.	21	1
Allegheny without Pittsburgh	0	19	3	9	n.a.	n.a.	25	3
Fayette	3	22	3	0	4	34	32	2
Washington	4	27	3	1	2	32	26	4
Westmoreland	3	23	2	4	2	35	30	2
Region	1	21	3	6	6	34	26	2
State	6	24	2	3	4	27	30	3

SOURCES: Pennsylvania Department of Education, *Secondary Vocational Education Statistics, 1986-1987*, 1988, Table 5.

n.a. = Not available. We cannot break out the difference between these two programs at the local level.

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[14] Statistics are difficult to come by in this area. We used National Center for Education Statistics, *High School and Beyond: An Analysis of Course-taking Patterns in Secondary Schools as Related to Student Characteristics*, U. S. Department of Education, March 1985.

Of the females enrolled in vocational education programs in the region, approximately 50 percent are enrolled in consumer homemaking economics or occupational home economics courses. Consumer homemaking curricula include those courses that traditionally have led to full-time homemaking. Occupational home economics curricula include courses designed for jobs outside the home including dry cleaning, food services, and interior design. Most home economics students are enrolled in consumer homemaking programs. However, this may be misleading because consumer homemaking courses are often prerequisites to occupational home economics courses.

The slightly larger percentage of female students in home economics courses than the national average might be the result of local culture and social values or different accounting frameworks. Course choices are up to the parent and student. Students cannot be forced into more lucrative or expanding career paths. The differences between regional and national gender enrollments, however, appear to be small.

The racial characteristics of vocational education enrollees closely follow the racial characteristics of the total school population.

Resources for Secondary Vocational Education

Funding for vocational education comes from the same sources as does other public school funding: federal, state and local taxes. The state appropriates a special vocational education fund to each school district that offers approved programs. The funds are distributed on the basis of number of enrollees and an equalization formula. Enrollees in AVTS are allocated a higher per pupil amount than comprehensive high school vocational education students.

The exact amount of vocational expenditures is difficult to obtain. In general, vocational instruction is more expensive to provide than general instruction because of the specialized equipment and teaching skills required (see Appendix A for details). We estimated per pupil vocational program expenditures using state data. These estimates are shown in Table 7. We estimate that the expenditures for vocational programs equaled $182 million in 1985.

Table 7

ESTIMATED EXPENDITURES FOR SECONDARY VOCATIONAL PROGRAMS (1985-1986)[a]

Area	Instructional Expenditures per Vocational Student[b]	Program Expenditures per Vocational Student[c]
Allegheny	$3,091	$6,791
Pittsburgh	$2,635	$7,281
Allegheny without Pittsburgh	$3,352	$6,781
Fayette	$2,088	$4,566
Washington	$2,080	$4,659
Westmoreland	$1,785	$4,488

SOURCE: Pennsylvania Department of Education, *Selected Expenditure Data for Pennsylvania Schools*, 1984-85; VEMIS enrollment data.

[a] Pennsylvania Inflation Index used 1.07 from National Education Association, *Estimates of School Statistics 1986-87*, p. 7, column 6; and *Ranking of States*, 1986, p. 53 H-9.

[b] Includes all activities involving the interaction between teachers and students and related costs that can be directly attributed to a program of instruction.

[c] Includes vocational instructional costs plus regular instructional costs for vocational students plus a prorated share of administrative and support costs.

PERFORMANCE INDICATORS

The performance of the system is a key variable that must be considered in determining whether the system is currently serving its constituents and how it may better serve them in the future. We concentrate on dropouts and graduations in this subsection. Test scores, another commonly used indicator, are not available regionwide. A standardized test is given by the state in eighth grade, but its relevance to high school students is questionable. Other standardized tests, such as SATs and ACTs, are not administered universally but taken only by those students who choose to apply to higher education institutions.

High School Dropouts

The dropout rate varies dramatically within the region. The city of Pittsburgh has the highest rate--close to 22 percent of all students will drop out in grades 9-12.[15] This is not much different than the dropout rate for the average urban school district, which was 20.8 for 1980 high school sophmores.[16] The rate in surrounding districts of Allegheny county is much lower than in the central city, as are the rates in the surrounding counties. These range between 8 and 10 percent.

The likelihood of dropping out varies by grade level. In Pennsylvania, approximately 92 percent of all dropouts quit in grades 9 through 12. Seventh through eighth grades experience much lower dropout rates. Thus, a 1.8 percent dropout rate for each year in grades 7 through 12 translates into 9.5 percent of the enrollees dropping out sometime in grades 9 through 12. We relied on state dropout data. The first column of Table 8 shows the total number of dropouts divided by the total number of enrollees in grades 7 through 12. The second column estimates the cumulative dropout rate for children in grades 9 through 12, assuming that 92 percent of dropouts occur in these grades.

The likelihood of dropping out varies by race. Within the state, blacks have three times the dropout rate of whites. Over the course of grades 9 through 12 this means that 34 percent of blacks will drop out compared with only 11 percent of whites in the state of Pennsylvania. National level statistics show approximately the same relationship.[17]

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[15] Dropout rates are from Pennsylvania Department of Education, *Public School Dropout Report 1986-87*, 1988 and *Dropout Rate by School District, 1985-1986*, 1987. Pittsburgh school officials say that the rate, as they calculate it, is higher: between 27 and 29 percent. Interview with Fred Monaco, Brent Johnson, Gina Scott, November 9, 1988.

[16] Center for Education Statistics, *The Condition of Education, 1986*, Office of Educational Research and Improvement, U.S. Department of Education, 1986, pp. 161-163.

[17] Center for Education Statistics, *The Condition of Education, 1986*, Office of Educational Research and Improvement, U.S. Department of Education, 1986, p. 163.

Table 8

SECONDARY PUBLIC SCHOOL DROPOUT RATES
(1985-1986)

Area	Rate/Year	Estimated Rate for 9-12[a]
Allegheny	1.8	9.5
Pittsburgh	4.4	21.8
Allegheny without Pittsburgh	1.1	5.9
Fayette	1.9	10.0
Washington	1.6	8.5
Westmoreland	1.6	8.5
Region	1.7	9.1
State	2.8	14.4
Blacks	7.4	34.0
Whites	2.1	11.0

SOURCES: Pennsylvania Department of Education, *Public School Dropout Report 1986-87*, 1988, and *Dropout Rate By School District, 1985-1986*, 1987.

[a] Using yearly rate, but with proviso that 92 percent of all dropouts in grades 7-12 occur in grades 9-12.

The near-term employment experiences of dropouts have been tracked in surveys at the state level. Many dropouts end up employed as unskilled laborers (32.9 percent), while others are unemployed (18.2 percent). Another group become homemakers (11 percent). This information is presented in Table 9.

Black dropouts have a much higher likelihood of unemployment and smaller chance of even unskilled labor opportunities compared with whites. We estimate using state statistics that statewide 7.5 percent of blacks entering 9th grade will end up with no high school degree and unemployed compared to 2 percent of whites. Of those entering 9th grade, 5.1 percent of blacks and 3.6 percent of whites will drop out and become unskilled laborers.

Table 9

STATE DROPOUTS BY POSTDROPOUT ACTIVITY AND RACIAL/ETHNIC CATEGORY

1986-1987

Postdropout Activity	American Indian/ Alaskan Native (%)	Asian/Pacific Islander (%)	Black/ Non-Hispanic (%)	Hispanic (%)	White/ Non-Hispanic (%)	Total (%)
Homemaker	0.0	4.2	12.4	9.9	11.1	11.1
Military	0.0	0.0	0.7	1.3	1.7	1.6
Skilled/semi-skilled laborer	0.0	8.3	4.7	5.3	6.1	6.0
Unskilled laborer	50.0	41.7	15.7	31.6	33.7	32.9
GED or other education[a]	0.0	8.3	8.7	8.6	6.9	7.0
Office/retail worker	0.0	0.0	3.4	0.7	3.3	3.2
Unemployed	33.3	8.3	22.1	15.1	18.1	18.2
Other/unknown	16.7	29.2	32.9	27.6	19.2	19.9
Total[b]	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: Pennsylvania Department of Education, "Public School Dropout Report 1986-87", 1988.

[a] GED = A study for a General Education Development credential.

[b] Totals may not sum to 100 because of rounding.

These general findings are reinforced by findings of a project sponsored jointly by the United Way and the Pittsburgh Foundation that held public hearings on minority youth employment.[18] These hearings showed that:

- A black graduate in Pittsburgh has less chance of getting a job than a white high school dropout.
- Over 40 percent of all black youth in the city who want to work and are seeking employment cannot find jobs.
- Only 25 percent of black youth who are in school and who live in Pittsburgh's poverty areas have bona fide jobs.

High School Graduates

The results of state surveys also show the job experiences of public school graduates. On average, about 50 percent of public school graduates in the state go on to some type of postsecondary institution, whereas 73 percent of private school graduates do.[19]

State statistics show that of those who do not go on to college, sales, unskilled, and semiskilled work are the largest employment categories next to the armed services. Professional, skilled, clerical, and farm work tend to draw fewer non-college-bound graduates. Non-college-bound graduate unemployment ranges from 12 percent in Allegheny and Westmoreland Counties to 27 percent in Fayette. This information is shown in Table 10.

A recent followup survey by the Pittsburgh city schools of 1987 graduates provided more specific insight into the experiences of those who graduated from the city schools, including those who went on to college.[20] Of graduate respondents from the city of Pittsburgh, 28 percent have full-time employment, 45 percent have gone on to further

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[18] *Highlights: Minority Youth Employment Public Hearing*, May 21, 1987.

[19] Pennsylvania Department of Education, *Public and Non-Public High School Graduates 1986-1987*, 1988.

[20] Based on Computer Printout for 1987, Pittsburgh Public School System using percentage of respondents.

Table 10

NON-COLLEGE-BOUND HIGH SCHOOL GRADUATES BY POSTSCHOOL ACTIVITY, 1986

(Percentage of respondents)

Activity	Allegheny	Fayette	Washington	Westmoreland
Postgraduate[a]	1.2	0.0	1.5	4.3
Armed services	17.5	11.4	15.3	15.7
Clerical	8.6	3.3	3.6	5.3
Farm	0.0	1.3	1.2	2.0
Homemaker	2.4	5.5	3.2	5.1
Unskilled	9.2	8.1	13.6	11.8
Semiskilled	7.1	4.9	9.1	4.3
Professional-technical	2.4	2.0	0.0	0.6
Sales	11.7	14.5	6.1	10.8
Services	3.1	2.1	5.6	7.4
Skilled	2.7	0.0	1.1	2.2
Unemployed	12.9	27.1	16.9	12.2
Unknown	21.1	19.5	22.5	18.24

SOURCES: Pennsylvania Department of Education, *Public and Nonpublic High School Graduates, 1986*.

[a] Attending additional high school after graduation.

education full-time, and 7 percent have gone on to full-time education with part-time employment. In total 52 percent have gone on to some type of further education. About 6 percent are seeking employment.

Vocational Education Program Completers and Placement

The success of vocational education programs depends, at least in part, on what percentage of students complete the full program and how many go on to jobs. Determining success in a quantitative sense is difficult because of data limits.

Vocational Education Dropouts and Completions. The school districts do not collect systematic information on dropouts by vocational versus academic tracks. Instead they collect information on the number of vocational program completers, but do not use it to develop completion rates. We attempted to do so, but found the results to be inconsistent. This is an area that would benefit from more data development.

The city of Pittsburgh does develop its own dropout rates by track.[21] Its figures show that in 1987 about 4.7 percent of all seniors dropped out. There was a large variation in rates depending on the educational track of the student. Academic track students had a dropout rate of zero, whereas vocational education students had a dropout rate of 3.2 percent. The general track students experienced a dropout rate of 13.6 percent. These percentages have varied somewhat from year to year, but in all cases the general track students experience a high dropout rate, the academic track students experience a zero dropout rate, and the vocational students experience a dropout rate between 2 to 4 percent. Finally, Pittsburgh officials noted that eventually over 40 percent of vocational graduates go on to some form of higher education.

Vocational Education Placement. Schools in the region offer placement services for students in the vocational education programs. While in school, students can participate in school-run placement programs that provide part-time work in the local community. These programs tend to be limited to students at risk of dropping out because of poor past performance or socioeconomic difficulties. Placement tends to be in low-skilled jobs that pay close to the minimum wage. After graduation, these students may keep these jobs or search for better employment elsewhere.

Currently, the demand for entry-level workers by the private sector exceeds the number of students available. Two factors seem to influence this. First, many of the jobs offered are entry-level with low pay. Many students refuse to take these jobs which they perceive to be "dead end." Second, placement counsellors must turn some employers away because the schools cannot supply enough students with sufficient skills for the jobs available. Counsellors preferred to turn down some job placements rather than send unqualified students, which would undermine the employer's evaluation of the school's programs. They argued that employers are more likely to continue offering placements if they know the school will screen out unqualified applicants.

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[21] Materials collected from interview with Fred Monaco, Brent Johnson, Gina Scott, City of Pittsburgh, Office of Vocational Education, November 9, 1988.

The current strong demand for labor is centered in several fields.[22] Demand for entry-level employees in business cannot be met. Demand comes from law offices, health benefits offices, claims processors, and general business offices. Pay for entry-level work is about $4 per hour. The retail industry is booming and demand is strong for cashiers and floor people. Pay, however, is at minimum wage. Food services also has strong demand in both fast food stores and restaurants. The going wage is about $3.50 per hour, but many jobs go unfilled. Day care, an unknown field ten years ago, is also booming although minimum wage is the norm.

Several fields have declined in demand and placement has become difficult for students without additional experience. These include drafting, welding, plumbing, and construction. Such jobs pay $4.75 per hour but are difficult to find.

Placement officials expect the current job market to improve in the near future for several reasons. First, lower birth rates and large out-migration from this area have left behind a demand for unskilled or low-skilled entry-level workers. Higher-skilled jobs or nonentry-level jobs have been filled by skilled, experienced workers laid off from heavy industry who will not consider an entry-level job. Thus, entry-level job openings are available for high school graduates. Second, smaller graduating classes cannot fill the demand for entry-level workers. Placement officials expect that the wages offered to high school graduates will increase as the mismatch between number of positions and number of graduates becomes more evident. This is already occurring: entry-level wages in the region have been rising for the last two years and employers are approaching the schools in increasing numbers.

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[22] The following information was discussed in interviews with Fred Monaco, Brent Johnson, Gina Scott, City of Pittsburgh, Office of Vocational Education, November 9, 1988.

The job experiences of vocational program completers can be determined from state survey data. These indicate that 87 percent of survey respondents are gainfully employed a year after completion. There are few striking variances within the region except for Fayette County. Results show that this county has had more difficulty placing completers than other counties. In addition, according to the state survey, Pittsburgh appears to place slightly fewer completers in related fields and slightly more in the military services than other counties, excepting Fayette. The survey results are shown in Table 11. The information is based on survey reports on vocational education program completers a year after they complete. The response rate has been about 44 percent. These results are tenuous at the local level because they are based on a small sample of total completers. For instance, the results of this state survey show that 29 percent of Pittsburgh vocational education graduates go on to further education, whereas surveys performed by the city of Pittsburgh with a 98 percent response rate show that about 40 percent go onto to higher education. Again this is an area that could benefit from clearer definitions and data development.

STATE AND LOCAL EFFORTS TO IMPROVE THE QUALITY OF SECONDARY EDUCATION

State and local efforts at improvements have addressed both basic and vocational programs. The following presents some of the major improvement efforts. These represent programs that affect all schools or are well known at the local level. We note that each district may have numerous valuable improvement programs that are not mentioned here.

State-Sponsored Basic Education Improvements

In line with many other states, Pennsylvania has recently reviewed and updated its curriculum at the secondary level. The review included public hearings and extensive state board deliberations which led to the complete revision of the state curriculum requirements effective September 1985. In the last few years the Pittsburgh region has been struggling to meet the new curriculum requirements.

Table 11

SECONDARY VOCATIONAL EDUCATION ENROLLMENT COMPLETER FOLLOW-UP[a] (1985-1986)

Area	Employed in Related Field	Employed in Unreleated Field	Military Service	Pursuing Education	Total Gainfully Placed	Unemployed Looking	Unemployed Not Looking
Allegheny	32.1	19.9	5.7	31.9	89.5	8.0	2.5
Pittsburgh	24.4	22.3	8.5	29.0	83.2	10.4	6.4
Allegheny without Pittsburgh	33.6	19.5	5.1	32.7	90.8	7.5	1.7
Fayette	23.1	22.1	5.5	18.9	69.7	24.4	5.9
Washington	26.0	24.6	6.2	30.4	87.2	10.7	2.1
Westmoreland	31.5	22.3	6.9	26.8	87.5	9.1	3.4
Region	30.6	21.1	6.0	29.4	87.0	10.0	3.0
State	35.6	23.2	6.8	23.7	89.2	7.6	3.2

SOURCES: Pennsylvania Department of Education, VEMIS printouts.

[a] Percentages based on respondents as opposed to total graduate/completers.

The new state regulations enforce stricter graduation requirements. This step was taken to raise the quality of education provided to all children in the state. Under the old regulations, to graduate, a child was required to have only 13 courses in grades 10-12: three in English, two in social studies, one each in mathematics, science, health, and physical education, and four electives. Now the child must have 21 courses in grades 9-12: four in English, three each in mathematics, science, and social studies, two in the arts and humanities, one in health and physical education, and five electives.[23] Vocational students must meet these requirements as well as those for vocational programs.

Impact on Vocational Education

The increased graduation requirements imposed by the state have had an especially strong impact on vocational students and vocational schools. Because the regulations expanded academic course requirements for all Pennsylvania students, they necessarily reduced the time that vocational students have to complete their nonacademic curricula and certification programs. In a sense, the new rules reduced these students' "margin of error"; if they miss or fail a required academic course they may be forced to complete their regular graduation requirements and not complete their vocational certificates. This has led some students to drop out of the vocational track altogether. The rules have inadvertently reduced the number of general and academic track students taking vocational courses.[24]

In addition, the requirements have placed a special burden on the AVTS whose students must commute back and forth between the AVTS and the sending school during the school week. The increased requirements, in the words of one AVTS director, have the effect of "locking vocational students out" because they do not have the time to commute to the vocational school and still complete their academic courses.[25]

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[23] Pennsylvania Department of Education, *Chapter 5, Curriculum Regulations of the Pennsylvania State Board of Education, Guidelines for Interpretation and Implementation*, 1988, p. 21.

[24] Pennsylvania Department of Education, *1987 Follow-up Survey on Chapters 5 and 6*, 1987, pp. 1-7.

[25] These problems were identified in interviews as well as the *1987 Follow-up Survey on Chapters 5 and 6*.

This problem has prompted competition for students between the AVTS and the sending school districts, spurred earlier by persistently declining total enrollments. With fewer students available, some school districts have worked to retain a greater share by offering vocational courses formerly taken at the AVTS or by holding students back from the AVTS.

State and local education officials recognize the unfair burden placed on vocational students by these attempts to improve the quality of education for all. To reduce the burden on the vocational education students and to reduce the impact on AVTS, several actions have been taken. First, the state has allowed the crediting of up to three vocational educational courses for required courses so long as each credit is made in a different field. For instance, a vocational education class in business mathematics may be credited as one of the three required math courses and a vocational engineering course can be credited as both a required science course and vocational course. The substitutability of courses must be determined in advance through filing of course material with the state. In general this allows students to use vocational education courses for required courses to reduce the work load.

Second, the state and localities have encouraged the AVTS to offer some of the required courses at their locations. In the past, students tended to take all the general educational courses at the regular high schools and the vocational education courses at the AVTS. Now the curriculum offered by AVTS may include English, history, or other required courses. This takes the burden off commuting students because they can fulfill their requirements at either location.[24]

Although the changes in curriculum have had some negative impacts on the vocational education programs, they have also had some positive results. Some administrators interviewed noted that steps toward integrating academic and vocational tracks, as forced by state regulations requiring common standards for graduation, may help to eliminate discrimination between tracks as all students must meet the new standards.

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[24] Pennsylvania Department of Education, *1987 Follow-up Survey on Chapters 5 and 6*, pp. 32 and 35.

Some vocational school officials, recognizing the impact on students in the vocational track, advocate that the state regulations be implemented using flexible options and stronger support for at-risk students. These options might include a longer school day, more school days, provision of more night and summer classes, and financial aid for students in need so they may attend classes rather than work.

Local Basic Education Improvements

Local districts have also made strong efforts to improve educational services depending on their particular needs. We focus on a brief example from Pittsburgh and one from the Mon Valley. We acknowledge, but cannot list, all the many other efforts that exist.

During the late 1970s and early 1980s Pittsburgh was plagued by problems such as disagreements between the board and the supervisor, rising dropout rates, and falling achievement test scores. The city tried to reverse this trend by initiating an improvement program with four foci:[27]

- Develop a needs-assessment process with strong emphasis on public consultation.
- Place a strong emphasis on instruction as the main purpose of the schools with programs specifically directed at low performing groups in the general population.
- Improve teacher quality through training, evaluation, and a staff development program.
- Build strong ties to and support from the larger community.

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[27] Based on background notes for a recent RAND study: Paul Hill, Arthur Wise, and Leslie Shapiro, *Educational Program Cities Mobilize to Improve Their Schools*, R-3711-JSM/CSTP, January 1989.

The new foci of the Pittsburgh schools received strong support from teachers, the board of education, and business leaders, and national-level attention as a model approach for improving schools.

More recently, the city took the unprecedented step of dissolving the general education track and forcing students into academic or vocational tracks. In addition, counseling, employment, placement, and special curricula programs are being devised to aid at-risk students in choosing a career goal and dedicating themselves to it. The reason is simple: to reduce dropouts. School officials think general-track students drop out at such high rates because they do not have clearly focused career goals. They predict that the total dropout rate for the city will begin to fall as the program takes effect. They recognize, however, that the dropout rate for vocational programs is likely to increase. Another repercussion of the change is that vocational enrollments will rise to between 65 percent to 75 percent of the total.

The surrounding school districts have attempted to address their particular problems. The Mon Valley, heavily reliant on the steel industry for an economic base, was devastated when the steel mills closed. High unemployment and lowered property values combined to reduce the financial ability of these communities to support education. Furthermore, education leaders in the area indicate that the culture of the steel mills, which did not require higher education to obtain jobs, encouraged lack of education support.

In response, 20 districts of the Mon Valley entered into a partnership to help make schools centers of excellence. The partnership, known as the Mon Valley Consortium, has dedicated itself to raising community consciousness of the need for educational support as well as to developing funding sources for educational improvement projects. Programs include teacher-specific grants to develop new education ideas, business/community partnership programs, career counseling, and curricula development. The ultimate goal of the consortium is to improve the well being of the region through educational upgrading.

Vocational Education Improvements

In 1985 the governor of Pennsylvania presented a plan to improve the vocational education system. In 1986 new standards went into effect. The major push behind the new program is to ensure that vocational education programs are justified by local labor market needs and are supported by local employers.[28] Each type of institution must meet the state standards and curriculum requirements, including program approval. Any programs designed to give students the background for a license must meet standards and requirements stipulated by the particular state licensing board. Each school must show that students have the requisite competencies in mathematics, science, and English before commencing vocational instruction. Approval of the program begins with a submittal every five years of a long-range plan which requires several parts. First, a needs assessment of the supply and demand for trained workers by the local and state businesses and industries must be included.[29] Second, the plan must show coordination among the programs offered among secondary, postsecondary, adult, and apprenticeship programs. The plan also must have a policy outlining the job placement strategy of the institution.

The state has also required additional community input into the curricula development process by requiring advisory boards for the program as a whole and for each subject area. Local advisory committees made up of representatives from education, industry, business, community-based organizations, apprenticeship councils, labor, management, parents, and students advise the school boards on the philosophy, objectives, and program needs of the schools; the school boards make decisions based on this advice. In addition, each vocational education program within an institution must have an occupational advisory committee consisting of representatives from business and industry actively engaged in the occupation for which training is being provided. The committee advises on curriculum and equipment and advises classroom teachers on performance objectives.

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[28] Pennsylvania Department of Education, *Regulations and Standards for Vocational Education*, Bureau of Adult Education, 1986.

[29] The long-range occupational forecasts used to develop the required state plans are based on information found in the state's *Occupational Trends and Outlook for Total Civilian Employment* produced by the Pennsylvania Department of Labor, Office of Employment Security. This is available to all districts. The forecasts are developed from employer surveys and are specific to substate regions. These same forecasts are used by the Job Training Partnership Act (JTPA) organization to determine likely occupations. Districts may keep program curricula in fields that are predicted to decrease in job openings if they can show a historic ability to place students in the area.

The impact of these changes depends on the existing programs, community involvement, and the resources devoted to the effort. For instance, the city had advisory committees for many years; thus, new regulations had little added impact. Other communities which did not have these committees may have had to make greater changes to meet the regulations.

In 1987, the Pennsylvania Economic Development Partnership commissioned a strategic review of job training in the state. The commission report supports several further changes including the following, but no actions have as yet been taken.[30]

- Restructure vocational education to provide greater leadership, policy direction, and connection to local business needs.
- Increase the professional development of vocational educators.
- Establish a demonstration project creating a technical institute using cooperative agreements between existing educational institutes to create a postsecondary technical training program within an existing AVTS.
- Replicate the "school-within-a-school" program operating in Pittsburgh and Philadelphia. (This refers to business-sponsored curriculum in the schools as sponsored by Mellon bank in Pittsburgh).

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[30] Pennsylvania Economic Development Partnership, *Task Force Report: Education and Job Training*, Commonwealth of Pennsylvania, Office of the Governor, January 1988.

The commission also has several recommendations concerning how to smooth the passage from school to work. These include better counseling for students on study fields, better connections to the business community, and special programs to mesh social services, educational services, and community support into a single program for disadvantaged students. (This has been done in the Successful Student's Partnership Program at 14 school districts throughout the state.)

III. POSTSECONDARY, FORMAL EDUCATION

We define the postsecondary, formal education system in the region as those institutions that provide formal credentials and courses at grade level 13 and above or for those 18 and older. We include only those students enrolled in courses for credit who are working toward a credential. The postsecondary level is voluntary, with a presumption that those who desire postsecondary education will find appropriate institutions and attend them. Much of the effort and cost associated with searching out and taking advantage of further educational opportunities falls on the individual. The costs include forgone income, an important concern for many.

Two types of education may be offered at these institutions. First, some offer four-year degree programs that prepare students for professional careers such as managers, teachers, engineers, accountants, physicians, artists, and the like. We do not consider these programs as part of the work-related educational system in which we are interested. Second, some offer two-year degree or other credential programs that provide specific occupational training for such jobs as appliance repair, secretarial work, computer programming, and practical nursing. Such training is oriented toward a local or regional job market and is our primary interest.[1]

The above division of educational services and clients between institutions was once fairly clear. Four-year colleges and universities offered the first type of education; community colleges, adult education programs, proprietary schools, and apprenticeship programs offered the second. In recent years these divisions have become less precise. On one hand, an increasing proportion of community college students are continuing their education in four-year colleges and universities. On the other hand, four-year colleges have bolstered their lagging enrollments by offering shorter-term occupational courses to prepare students for immediate local employment. Noting these small but growing ambiguities, we will focus most of our attention on occupational education in the community colleges, adult education, proprietary schools, and apprenticeship programs. Thus, this section provides a overview of the many institutions, a brief description of the four-year colleges, and then in separate subsections descriptions of four providers of most interest.

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[1] The state of Pennsylvania describes these programs as ones that "encourage and promote postsecondary and adult vocational education opportunities and services which will facilitate the attainment of economic independence and the development of human potential." Pennsylvania Department of Education, *Regulations and Standards for Vocational Education*, Bureau of Adult Education, 1986, p. 3.

OVERVIEW

There are numerous formal, postsecondary institutions in the region. We estimate that there are about 90 schools including: six state and state-related schools, 12 private four-year colleges and universities, two community colleges, and over 70 proprietary schools. In addition, unions offer over 450 apprenticeship programs and numerous adult education classes are held at local high schools, AVTS, and community colleges. The majority of providers and enrollees are in Allegheny County.

Size of enrollments varies by type of institution. In 1987 the state four-year colleges and universities enrolled about 39,600 students. The private colleges and universities enrolled 29,000 students. Together, these four-year schools accounted for about 70 percent of enrollees in degree-granting programs. The community colleges enrolled 21,300 students. We estimate that the apprenticeship programs had 3,400 participants and the proprietary schools enrolled approximately 6,600 students in specialized associate degree programs and another 10,300 to 12,700 in certificate or diploma programs.[2] These latter two types of providers, by far the most numerous, enroll fewer students per program, whereas the state, state related schools, and community colleges enroll larger numbers at each institution.

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[2] Enrollments for proprietary schools are for 1985-1986.

Approximately 5,300 students enrolled in vocational adult education classes in 1986.

National enrollments in institutions of higher education (universities and colleges granting degrees) steadily grew from 9.6 million in 1973 to 12.2 million in 1985--a 27 percent increase in 12 years.[3] National enrollments in higher education peaked in 1983 and have dropped slightly since then. This increase is due, at least in part, to a greater percentage of high school graduates going on to institutions of higher education: 29.7 percent in 1973 compared to 33.7 percent in 1985. This trend was echoed in Pennsylvania where higher education enrollments rose from 448,629 in 1973 to 539,850 in 1985--a 20 percent increase in the last 12 years.[5] However, Pennsylvania lags behind the national average of those 25 years old and older who have completed four years of college: The national average was 16.2 percent in 1980 and Pennsylvania's was 13.6.[6]

Pittsburgh's higher-education college and university enrollments increased by 14 percent in the last 12 years, but not to the degree of the rest of the country.[7] The comparatively low rate of overall increase may be because Pittsburgh as a whole has lost population as a result of out-migration, with those in the college-age bracket leaving in especially large numbers.[8] The growth has not been spread evenly across all institutions. The community college enrollments increased by 31 percent, and enrollments in the state and state-related schools remained more stable. The private colleges and universities have grown by 21 percent. We cannot estimate the growth in apprenticeship programs.

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[3] Center for Education Statistics, *Digest of Education Statistics, 1987*, U.S. Department of Education, p. 122.

[4] Center for Education Statistics, *Digest of Education Statistics, 1987*, U.S. Department of Education, p. 155.

[5] Pennsylvania Department of Education, *Higher Education Fall Enrollments*, 1980 and 1985.

[6] Center for Education Statistics, *Digest of Education Statistics, 1987*, U.S. Department of Education, p. 16.

[7] A listing of these schools is in Appendix B. Numbers are from Pennsylvania Department of Education, *Our Colleges and Universities Today: Summer and Fall Enrollments, 1980*, 1981; and *Higher Education Summer and Fall Enrollments, 1985*, 1986.

[8] See Thomas Blennan, 1989.

Dependence on different revenue sources varies by institution type. The state and state-related schools receive a large proportion of their funds from state sources. Private colleges and universities and proprietary schools depend more on tuition and fees. The community colleges rely on a balance of state, local, and tuition sources. Apprenticeship programs are funded from the actual labor of the participants. (Further detail is provided in Appendix A.)

The differences in revenue sources available to the different institutions are reflected in the tuition and fees charged to students. The tuition and required fees charged by private colleges, private universities, and proprietary schools offering degrees are substantially higher than those for the public colleges.

FOUR-YEAR COLLEGES AND UNIVERSITIES

The state schools and the private four-year colleges and universities offer primarily a combination of classic liberal arts education with selected professional, teaching, managerial, and agricultural courses. Some have begun to offer short-term occupational courses, as we will note below, but these remain a small part of their program offerings and enrollments. The student populations are diverse, but admissions are selective.

The state divides its four-year institutions into two parts. The state school in the region is California University of Pennsylvania. The state-related schools include Pennsylvania State University in McKeesport, Fayette, and New Kensington, and the University of Pittsburgh at Main and Greensburg branches. The state university branches act as feeder schools for the main campus, functioning somewhat like junior colleges.

Enrollments

The four-year colleges and universities in the region enrolled 68,600 students in 1987.[9] The one state school enrolled 5,900 and the five state-related schools enrolled 33,700. The private schools enrolled 29,000 in 12 institutions. Approximately 80 percent of these enrollees were in institutions in Allegheny County. The average size of schools varied. The state and state-related schools averaged 5,900 and 6,700, respectively, and the average size of the private schools was 2,400.

Enrollees can be either full- or part-time students. Enrollees in the state school programs tend to be full-time students; almost 80 percent of students in the state system and 63 percent of students in the state-related system are full-time. Private colleges and universities also tend to have full-time students (67 percent).

Higher-Education Expenditures

The expenditures per pupil and tuition fees vary dramatically by type of institution.[10] The state and state-related systems expended between $2,900 and $3,100 per student in instruction in 1985 and the private schools expended about $3,250. Tuition at the state schools, with their large amount of state funding, ran about $2,100 per year in 1985. The state-related schools charged $3,250. The private colleges, which are more dependent on tuition, charge considerably more. The average tuition in the region's private colleges and universities was about $7,000.

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[9] Enrollment numbers come from Pennsylvania Department of Education, *Higher Education Fall Enrollments, 1987*, 1988.

[10] Expenditure data come from Pennsylvania Department of Education, "Higher Education Financial Statistics, Current Funds Expenditures and Mandatory Transfers for Fiscal Year Ending 1986." This is an unpublished computer printout.

Vocationally Oriented Programs

The state and state-related schools and several colleges in the area offer limited vocational education programs to approximately 1,750 students or 1,300 full-time equivalents.[11]

The state and state-related schools enroll approximately 2,200 students in certificate and associate degree programs of which we estimate about 1,300 were in vocational programs.[12] Many of these students go on to four-year degree institutions. This is equivalent to 1,000 full-time-equivalent students.

Two private colleges in the region offer occupational curricula in addition to their more traditional bachelor's degree programs. They are Point Park College and Robert Morris. All others offer only four-year degrees. These two colleges tend to enroll part-time, older students: The median student age for both institutions is 27.

Point Park College, in downtown Pittsburgh, offers a stepped curriculum from certificate occupational courses through associate degrees to bachelor's degrees. Students can stop at any point in the process. The large majority of their approximately 100 certificate students (or 60 full-time-equivalent students) are in business-related courses in accounting, computer programming, or general management. Because the majority of their students are part-time or short-term, only about a fifth of their students complete certificates in any given year.

Robert Morris College, a business-oriented college with locations in suburban Coriopolis and downtown Pittsburgh, offers certificate and associate degree courses as well, primarily in a secretarial sciences program. The approximately 350 certificate students (245 full time equivalent students) take courses concentrating on health, legal, executive, and word-processing-related skills. They also offer certificate programs for paralegals, business administration, and accounting. All of the certificate program students can go on to enroll in related associate degree programs.

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[11] Full-time equivalent equals full-time students plus the full-time equivalency of the part-time students as reported by each institution.

[12] Enrollments by degree type and degrees offered by different institutions are from Pennsylvania Department of Education, *Degrees and Other Formal Awards Conferred 1985-86*, 1986.

We estimate expenditures in 1985-1986 for these occupationally oriented students to be $4 million for the state colleges and $1 million for the private colleges. Because of data limits, these estimates are based on average institutional costs of all programs in the schools as opposed to vocational program costs.

COMMUNITY COLLEGE

The two-year college movement that swept the country in the decades after World War II produced three distinct kinds of institutions: junior colleges, which offer economical and accessible preparation for further study at four-year colleges or universities; community colleges, which offer two-year associate degrees and continuing education for all; and technical colleges, which offer specific occupational training.[13] The community colleges in the Pittsburgh region have embraced all three of these missions. (There are no junior or technical colleges in the region.) The community colleges were created to serve local residents whose educational needs might not be met by other schools. They have comparatively open admissions. Many of their enrollees are in occupational and vocational programs with the intention of competing for local jobs after graduation.

In the mid-1960s, the Pennsylvania state legislature gave each county discretion to sponsor the creation of its own system, subject to only limited regulation by the state. The Allegheny and Westmoreland County boards of commissioners established colleges and appointed boards of trustees to oversee them. The trustees' responsibilities under state law are primarily fiduciary. For the most part, the colleges are governed and administered by their presidents and professional staffs.

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[13] For background information see: Commission on the Future of Community Colleges, *Building Communities: A Vision for a New Century*, American Association of Community and Junior Colleges, Washington, D.C., 1988, Chapter 1.

Enrollments

Of the two community colleges in the Pittsburgh region, the Community College of Allegheny County (CCAC), with four campuses and more than 17,000 credit students, is the largest.[14] Westmoreland County Community College has 3,600 credit students. CCAC dominates in coverage as well as size; it offers courses in Fayette, Green, and Washington Counties, which lack their own community college systems. Nevertheless, both systems have increased enrollments fairly steadily over the last 15 years (see Table 12). CCAC and Westmoreland CCC peaked in 1983 at the height of the recession but have maintained enrollments near their peaks since then. The community colleges have predominantly part-time students (over 60 percent are part-time).

The community colleges tend to enroll older students than the four-year institutions. The average age of students at the Community College of Allegheny County is 28 years, but the average conceals a bimodal profile of student enrollment. In recent years CCAC has primarily enrolled two distinct sets of students. One set is 18-22 years old,

Table 12

ENROLLMENT CHANGE AT THE PITTSBURGH
REGION COMMUNITY COLLEGES

Area	1973	1980	1986
Allegheny	15,094	16,142	17,251
Westmoreland	1,557	2,827	3,595

SOURCE: Pennsylvania Department of Education, *Our Colleges and Universities Today*, 1980 and 1986.

NOTE: Table shows total enrollments, not full-time-equivalents.

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[14] In addition, CCAC enrolls approximately 5,000 to 6,000 FTE noncredit students. Institutional Research Planning and Coordination, *Bottomlines: Trends in Planning Data, 1987-1988*, Community College of Allegheny County, December 1988, p. 18.

just out of high school. They are more likely to use the community college as a junior college and transfer to a four-year institution after completing their associate degrees. The second set is in its late 20s and 30s, either laid off from work or unsatisfied with the employment opportunities available to them with their current training. They return to a formal educational setting for a variety of reasons, including both specific occupational or technical training and starting a four-year bachelor's degree program. The balance between these groups has remained relatively stable during this decade, although the share of 18-22 year old students has grown slightly (to about 61 percent) since the worst of the recession in 1982 and 1983.[15]

An increasing number of students are taking advantage of "articulation agreements," made between the college and other institutions, so that the students may transfer to four-year institutions to complete bachelor's degrees. Articulation agreements between institutions allow a student to receive full course credit for any work taken or continue a curricular track across institutions. The agreements work in two directions. On one hand, local high schools make them and send their students to CCAC after graduation. On the other hand, CCAC has similar arrangements with the University of Pittsburgh and other institutions that allow students to carry on programs of study initiated at CCAC. The agreements are usually made program by program, and cover both occupational and academic courses. The proportion of students in "career" or occupational courses at the community college has remained relatively stable at 60 percent of all enrollments over the last five years, whereas the proportion of students in "transfer" courses planning to move on to four-year degree programs has remained relatively stable at 30 to 35 percent.[16] As might be expected, the large majority of students in "transfer" curricula do in fact transfer to four-year institutions. But a study of 1985 CCAC graduates also found that more than 28 percent of students in "career" curricula also go on to four-year institutions.[17] Thus, about 40 percent of the students receive associate degrees in career courses and do not go on to further education. We estimate 1985-1986 vocational credit enrollments in both community colleges to be about 13,000 students or 8,600 full-time-equivalents.

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[15] Office of Institutional Research, Planning and Coordination, "Bottom Lines: Trends in Planning Data," Community College of Allegheny County, October 1987, p. 20.

[16] Data from Office of Institutional Research, Planning and Coordination, CCAC.

In the most recent school year, 1988-1989, the CCAC experienced a large jump in enrollments of approximately 12 percent. Officials at the school have not as yet determined the causes for this unexpected jump nor have they determined whether it is a trend or an anomaly.

Resources and Expenditures

As enrollments have grown in recent years the total revenues of the colleges have grown as well.[18] Community colleges in Pennsylvania continue to operate under the fiscal formula close to the one established in the mid-1960s. One-third of their revenues comes from the state (31 percent), and the board raises the local share from local government funds (22 percent of revenues) and tuition from its students (26 percent of revenues). The federal government provides revenues directly to the colleges (12 percent of revenues), but also provides indirect revenues through student educational grants and loans. The colleges raise some money through private fundraising and sales of services and products (9 percent). The general funding sources of the institutions have remained essentially stable over time.

The balanced resource base allows the community colleges to charge less for tuition than many other providers. CCAC charged about $1,200 for a full-time student in 1987 and Westmoreland charged about $800.[19]

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[17] *Bottomlines*, p. 38.

[18] Revenue information comes from Pennsylvania Department of Education, "Higher Financial Statistics, Current Funding Revenues by Sources for Fiscal Year Ending 1986". This is an unpublished computer printout.

[19] Pennsylvania Department of Education, *Basic Student Charges at Institutions of Higher Education 1987-88*, 1988.

We estimate that the expenditures on vocational credit students at the community colleges were approximately $32 million in 1985. Because of data limits, this estimate is based on average instructional costs of all programs in the school, as opposed to vocational program costs. Vocational program costs may be somewhat higher than this estimate.

Curriculum and Change

Curricular shifts within the community college system are difficult to document and interpret. Each college retains substantial control over its curriculum and program, and each college has different ways of tracking its students.

Although the colleges do not appear to be shifting their core programs substantially, their programs constantly shift at the margins. These changes are in response to student demands for training appropriate to a changing regional economy and in response to changing support available from the local, state, and national programs. Although the colleges are often able to maintain this flexibility using their own permanent faculty and facilities, at times they do it by playing a "brokering role." In conjunction with the Customized Job Training or Job Training Partnership Act programs, for example, they look for a potential demand for training for some group of people or employers in the labor market, then draw on external sources to fund courses to fill that demand.[20] Once trainees and funds are identified, they organize instructors and facilities to provide the courses.

ADULT EDUCATION

The local communities offer adult education to the general public as well as secondary education. Enrollees attend classes at the high schools, AVTS and community colleges on weekends or during evenings. Courses offered include: basic skills courses such as English and math; English as a second language courses; and job training courses. The job training courses are largely funded through JTPA.

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[20] See Sec. V for discussion of these programs.

We consider only the enrollees in job training programs to be work-related students. Vocational adult education enrollments were 5,300 in 1985-1986, with close to half of those in Allegheny county.[21] We estimate adult education current expenditures per course to approximate those for a secondary vocational student per course. And we estimate the total regional current expenditures for work-related adult education to be $4 million in 1985 as shown in Appendix A.

PROPRIETARY SCHOOLS

Private proprietary schools have missions quite different from the colleges and universities. They are profit motivated, private sector businesses that draw students interested in short-term occupational training, usually in a single field or in a narrow set of fields. Most simply offer certificates that a student has completed a particular course, but some in the Pittsburgh region are licensed by the state to offer specialized associate degrees.[22] As part part of the private sector they are more susceptible than other educational institutions to upswings and downturns of the market, so many of them have shorter lives than the other educational institutions. The proprietary schools fill a special niche in the work-related educational community, acting like private trainers but often providing accredited coursework and associate degrees common to other postsecondary institutions.

The Pittsburgh region has approximately 70 proprietary schools. Eighteen offer two-year associate degrees.[23] These 18 and the other schools also offer diplomas, certificates, or both. These credentials show that the recipient has taken a specific number of hours of training from the school in a particular field. The certificates and diplomas do not have the universal acceptance associated with the more formal two- and four-year degree programs. These schools tend to be small compared to colleges and universities and 75 percent are located in Allegheny County.

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[21] Pennsylvania Department of Education, Division of Data Services, *Vocational Education Management Information System, 1986-1987.*

[22] For instance the Art Institute of Pittsburgh offers two-year, specialized associate degrees in fashion illustration, fashion merchandising, interior design, photography, and visual communication. Computer Institute offers degrees in business administration, accounting, and legal assistance. Specialized associate degrees are equivalent to regular associate degrees but require more vocational courses and fewer general courses.

[23] The number offering degrees changes from year to year as schools go in or out of business or change program offerings.

Before presenting material on these schools, some caveats are in order. Information on these schools is scant. We know of no studies that have systematically examined this category of education provider and few studies of education providers that even discuss them. To find out more about these types of providers and the role they play in providing vocational education in the Pittsburgh area we visited several and interviewed the directors or admissions officers. In addition, we used state data on the 18 that offer specialized associate degrees, the *Vocational Resource Directory*, and the *Book of Business Lists*[24] to estimate the number of students enrolled, the types of courses offered, tuition, and expenditures. Thus, our information is based on a very small sample of self-selected schools. The responses we obtained from the schools visited cannot be viewed as "normal." The schools visited constitute a self-selected group of participants that tended to be firmly established with a long history in the Pittsburgh area.

Finally, proprietary schools have come under increased national scrutiny in the last few years because of questions concerning their use of federal student loans. A report issued by the U.S. Department of Education in 1988 criticizes some unscrupulous schools for encouraging unqualified enrollees to obtain student loans. The students subsequently drop out and are not refunded their money, thus increasing the revenues of the school.[25] Proprietary school accrediting boards were quick to point out that this type of activity was limited to a few schools, not the majority.

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[24] Western Pennsylvania Advanced Technology Center, *Vocational Resource Directory*, 1984. Pittsburgh Business Times, "25 Largest Pittsburgh Area Private Career Schools," *1988 Book of Business Lists*, Vol. 7, No. 20.

[25] *Consumer Rights and Accountability in Post-Secondary Vocational-Technical Education: An Exploratory Study*, U.S. Department of Education, 1988.

Actions have been taken by the federal government and accrediting boards to reduce this type of behavior. Our study does not deal with this issue. We did not attempt to assess whether schools in the area are under particular scrutiny, but were told in interviews with those outside the proprietary schools that most proprietary schools in the Pittsburgh region are reputable and several have national-level reputations for excellence.

Purpose of Schools

The schools are primarily geared for non-college bound students who recognize they do not want a four-year degree. School officials interviewed stated that by attending a proprietary school students can upgrade the skills learned in high school and gain more specific skills needed by businesses. School officials claimed that high school teaches generic skills, whereas these schools "polish the skills" and make them more applicable to the jobs that are available. In short, the purpose of attending these school is to obtain *a particular job* that is known by the student to require specific skills.

Admissions and Enrollments

Students choose this type of provider over others such as the community college for three possible reasons. First, it often takes less time to go to these schools. Courses offered are intensive: the students usually attend full-time and without vacation. Thus, the time necessary for completing skill training is less than for a community college. Second, the schools tend to offer only technical training: English, history, or math are not normally required. The concentration on technical skills reduces the time needed for completion. Third, the schools offer placement services. The schools interviewed had placement records of 80 percent to 100 percent depending on the field. The discussions with school leaders suggest that the schools were attractive to students because they offered a high probability of placement as well as training.

The schools tend to require a high school diploma, regardless of whether the student is interested in an associate degree, a certificate, or a diploma. School officers noted an increase in the last few years of older enrollees, usually displaced workers, retirees, or homemakers re-entering the workforce.

Many students qualify for student aid, usually student loans. Participation in JTPA programs varied by school. Some officials stated they did not encourage this connection, others enrolled substantial numbers of JTPA students.

Those schools offering specialized associate degrees tend to have full-time students (95 percent) in their degree programs. This high percentage of full-time students may be because the coursework tends to be concentrated into a shorter time frame than in other institutions. The full-time or part-time nature of other proprietary students is unknown.

No data source exists for enrollments in all these schools. State data cover only the 18 schools offering specialized associate degrees. We have used this and other sources to extrapolate total enrollment as outlined in Appendix A. We estimate total enrollments in these institutions to be between 16,900 and 19,300. This total estimate is based on scant data. Nevertheless, more firm state data show that enrollments in degree-granting programs at these schools equals 6,600 students or 6,440 FTE, about 75 percent as many as the community colleges. Thus, these schools are a major provider of work-related associate degrees at the secondary level and work-related education in general.[26]

Curriculum

Each school tends to specialize in one or a few related occupational areas. For instance, a school might specialize in cosmetology or business, but not both. The emphasis on a specialized area means most do not offer remedial courses in English or math. The schools interviewed did offer free tutoring in the technical subjects.

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[26] Pennsylvania Department of Education, *Higher Education Fall Enrollments, 1985*, 1986.

The majority of the schools in the area offer courses in business (22 schools), technical skills (16 schools), or beauty salon techniques (10 schools). The business category includes schools that offer secretarial, computer programming, word processing, real estate, finance, travel, and accounting courses. The technical schools offer courses in welding, drafting and design, electronics, plumbing, avionics, machine tooling, and auto or truck mechanics. Finally, a disparate group offers courses such as bartending, mortuary sciences, floral design, and truck driving (these are noted under the "other" category in Table 13).

Tuition and Expenditures

These schools are highly dependent on tuition and fees for revenues. The schools offering degree programs rely on tuition and fees for 75 percent of their revenues. Federal sources (12 percent) and sales (7 percent) account for most of the rest of the revenues.

Table 13

OCCUPATIONAL COURSE OFFERINGS IN AREA PROPRIETARY SCHOOLS

(1984)

Occupation	Associate Degree	Certificate	Diploma	Total Number of Schools
Art	1	0	1	2
Beauty	1	3	9	10
Broadcasting	0	0	1	1
Business	7	17	15	22
Health	1	3	1	3
Interior and fashion design	0	2	1	2
Modeling	0	2	2	3
Technical	7	6	11	16
Other	0	6	2	8

SOURCE: Western Pennsylvania Advanced Technology Center, *Vocational Resource Directory*, 1984.

The tuitions associated with these schools vary by occupational field, the certification granted, and the school. The wide variances in length of course, cost, and accuracy of reporting does not allow easy computation.

We have, however, attempted to estimate expenditures. These estimates are based largely on extrapolations from state data on the 18 schools with associate degree programs. The methods are outlined in Appendix A. We estimate the total current expenditures for the proprietary schools in 1985 to be between $48 million and $79 million, with a reasonable figure being $59 million. We note that the $79 million estimate favors overestimation of the expenditures involved.

Regulation

The schools are regulated by affiliated associations and the state to ensure compliance with minimum education standards. The National Association of Trade and Technical School (NATTS) or the Association of Independent Colleges and Schools (AICS) are two voluntary associations that regulate the private trade schools. Members of NATTS and AICS are accredited through a process similar to those for other colleges or universities. These accrediting groups visit the school regularly, inspect the premises and equipment, and review curriculum. Inspection teams are usually owners or administrators of other proprietary schools. Recommendations are issued for improvements and affiliation revoked if problems are not remedied. Members must also abide by the policies set forth by the accrediting institutions. For instance, NATTS has a refund policy that allows the early dropout to obtain a prorated refund.

In addition, the Pennsylvania State Board of Private Licensed Schools regulates *all* the proprietary schools whether or not they offer degree programs. Each must be licensed by the state and meet curriculum review requirements. Licenses are renewed once every two years depending on a review of curriculum, enrollments, and financial statements. Like the accrediting associations, the board makes recommendations and refuses licensing until problems are resolved.

Placement and Employers

According to our interviews, success in the industry depends on finding a market niche and developing a reputation in that area. Like any business, the schools attempt to maintain the quality of their product, in this case graduates. If the school graduates are not skilled, employers will not hire them and the schools' reputation with students and employers will decline.

Interviewees stated there has been a downsizing in employers. They hypothesized that small employers cannot afford a job candidate search or training time the way larger employers can. Therefore, small employers rely more heavily on these types of schools as trainers and placement agencies. The trend toward reduced firm size in the region was expected to possibly increase enrollments because of the dependence of small firms on external training and placement sources.

Placement can be out of the area and out of state. For instance, two schools interviewed had extensive placement with national employers. The wages paid in the jobs placed are above minimum wage and run between $6.00 to $10.00 per hour.

Some of the schools offer customized training,[27] although it appears to encompass a small percentage of students. An employer will contract with the school to teach its employees a particular skill. These types of contracts are lucrative; each official interviewed stated his or her intention to increase enrollment in this area.

Challenges

Competition for students in the area is fierce and growing fiercer because of the area's demographic trends. The migration out of the area and the reduced size of the cohort group compared to the baby boom years make it inevitable that there will be fewer prospective students. This has recently caused some schools to close or lay off staff.[28]

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[27] Job training for a specific firm that is customized to the firm's needs. The firm and the school agree on the training program and the firm sends its students to the schools at an agreed upon rate.

[28] Jan Bamford, "Control Data Closing Local School," *Pittsburgh Business Times*, April 25-May 1, 1988, p. 1.

Lower numbers of total students, however, does not mean lower enrollments in particular schools. Enrollments can be maintained with more advertising and recruitment. Schools use radio and TV announcements, job fairs, and mailouts to recruit students.

Some fields of study have increasing enrollments (e.g., computer-aided design and travel) and others have declining enrollments because the industry is shrinking. Even in growth fields enrollment is limited by market area. Few of these schools draw students from outside the Pittsburgh area. The pool of potential students, therefore, is limited.

UNION AND APPRENTICESHIP PROGRAMS

Union activity in the Pittsburgh region has always been strong, so it is not surprising that the region has many apprenticeship programs. Most apprenticeship programs are run by unions to develop the skills and crafts needed by their members. It can be seen as a self-improvement mission, regulated by the unions and the Apprenticeship and Training Council of the Pennsylvania Department of Labor and Industry. A review of programs by the Western Pennsylvania Advanced Technology Center identified about 450 apprenticeship programs, primarily located in Allegheny County (69 percent).[29]

Approximately 3,400 apprentices participated in these programs in 1984. These programs cover a variety of skills. The largest concentration of apprentices is in industrial trades programs (32 percent of apprentices), which include iron workers, mechanics, millwrights, machinists, tool and die operators, and sheet metal workers. The next largest is in the building trades (23 percent of all apprentices), which includes skills such as bricklayers, carpenters, drywall finishers, painters, plasterers, and roofers. Plumbing and pipefitters programs account for 15 percent of apprentices, auto mechanics account for 11 percent, and machinists account for 9 percent. The rest of the apprentices are in smaller programs such as medical technicians and drafting.

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[29] Western Pennsylvania Advanced Technology Center, *Vocational Resource Directory*, 1984.

The programs basically consist of on-the-job training by the apprentice under the guidance of a journeyman. Apprentices are encouraged to attend formal classroom training provided by traditional courses at the proprietary schools and community colleges. The apprentice pays for these courses out of earnings. The programs usually take between two and four years to complete, with the average number of hours of training being 7,000. Completion means union certification of journeyman status with commensurate increases in earnings and job opportunities. Because of the nature of this training, we associate no expenditures with it.

IV. POSTSECONDARY, INFORMAL EDUCATION

Private sector firms are major suppliers of education and training. Employers provide two general types of training: (1) on-the-job (OJT) and informal training and (2) formal training. The formal training may be developed and delivered by the firm, consultants, or a separate training institution.

Private sector training is important not just for its magnitude, but also for its character. This type of training is usually job-specific, geared not only to the technical requirements of a particular job, but often to the particular needs of a specific firm. Private sector training tends to be very applied when compared to training offered by colleges and universities.

An accurate map of the Pittsburgh education and training system should reflect the richness of this source of training. Information about private sector training, however, is very scarce. It tends to be anecdotal, with no standard set of definitions used.[1] The difficulties of mapping this source are evident from the fact that in 1985 the Pittsburgh region had over 46,800 firms.[2] Approximately 69 percent were in Allegheny County. Over 55 percent had four or fewer employees and only 65 had 1,000 or more employees. These firms cover all major categories of product classification. The diversity of firms suggests a very diverse set of private sector training programs in the area.

We approached the mapping of this sector in two ways. First, we reviewed the literature on private sector training. This literature tends to be firm-specific or aggregated to the national-level. We used national level studies done by Carnevalle and Goldstein, Lillard and

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[1] A reasonable discussion of the problems with measurement and definition in the field is found in Anthony Carnevalle and Harold Goldstein, *Employee Training: Its Changing Role and an Analysis of New Data*, American Society for Training and Development, Washington, D.C., 1983, pp. 31-36.

[2] Bureau of the Census, *County Business Patterns 1985, Pennsylvania*, U.S. Department of Commerce, Washington, D.C., August 1987.

Tan, and *Training* magazine as a basis for estimating the extent and characteristics of private sector training in Pittsburgh.[3] Second, we conducted interviews with members of the private sector training community and with a handful of employers. From these sources of information we sketch a brief picture of private sector training in the Pittsburgh area.

EFFECTS OF INDIVIDUAL CHARACTERISTICS ON TRAINING OPPORTUNITIES

The national-level surveys and analyses that we have noted addressed the question of whether an employee's personal characteristics influenced the probability of his receiving training.

The likelihood of getting most kinds of postschool, private sector training rises with the level of schooling attainment. Carnevalle and Goldstein agree with Lillard and Tan that better educated workers receive a disproportionate amount of training. Lack of formal education, therefore, limits access to postschool training investments in most kinds of job training and to resulting individual improvements in productivity and income.

Lillard and Tan found that the likelihood of getting most kinds of training is low in the first five years in the labor market, coinciding with an initial period of job search. The likelihood of training rises with time on the job. Carnevalle and Goldstein found a similar pattern when observing the age of trainees. Training opportunities increased dramatically in the 25-34 cohort and declined only slightly for the 34-44 cohort. Younger and older workers were less likely to receive training.

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[3] The following are three recent studies describing private sector training. Carnevalle and Goldstein, op. cit.; Lee Lillard and Hong Tan, *Private Sector Training: Who Gets It and What Are Its Effects*? The RAND Corporation, R-3331-DOL/RC, March 1986; "Training Magazine's Industry Report 1988," *Training*, October 1988, pp. 31-60. These sources agree on a general picture of who is likely to receive private sector training and which industries concentrate on training.

Research has shown that training opportunities vary by gender and race. Carnevalle and Goldstein found that men are more likely to receive training than women. The authors postulate this may be because women are more predominantly in occupations or industries that do not require intensive training. Lillard and Tan found that non-white men are significantly less likely to get most kinds of job training even after controlling for observable worker attributes. Training opportunities for women were not found to vary by race.

FIRM SIZE, THE ECONOMY, AND TRAINING OPPORTUNITIES

The studies mentioned above attempted to look at how the economic conditions in an industry or location might affect the probability of an employee receiving training.

Both studies found that smaller firms tend to offer fewer training opportunities. The exact magnitude of this difference between large and small firms has not been quantified. It is not clear whether smaller firms train proportionally fewer people or whether they spend less per employee on training.

Discussions with businessmen in Pittsburgh indicate that many smaller firms recruit employees from larger firms in the same industry. The smaller firms rely on the larger firms to provide training and experience that they cannot afford to provide themselves.

Lillard and Tan found that rapid technological change in the industry of employment increases the probability of getting managerial training and training from in-house sources such as company programs and OJT, but decreases the probability of getting professional, technical, and semiskilled manual training or training from external sources. It appears that rapid rates of technical change are associated with an increased reliance on in-house training, possibly because skills specific to new technologies are not readily available outside the firms.

In addition, Lillard and Tan found that the likelihood of getting most kinds of training is smaller in local labor markets with persistently high unemployment or greater cyclic volatility relative to the nation as a whole.

TRAINING OPPORTUNITIES BY INDUSTRY AND OCCUPATION

The probability of receiving private sector training varies by industrial sector and by occupation.

A recent survey of firms with 100 or more employees by *Training* magazine shows that firms are more likely to offer training to managers as compared to lower-level or entry-level workers.[4] Carnevalle and Goldstein reached a similar general conclusion: White collar employees get more training than blue collar or service workers. Professional, technical, managerial, and crafts workers receive the most training. However, the *Training* survey also showed that, because there are more lower-level employees, more of them will be trained than managers in the companies offering training.

Finally, the opportunities for training varies by industry. An analysis by Carnevalle and Goldstein developed indices to show the concentration of training by industrial sector. Their results show that the public administration sector offers the most opportunities for training (an index value of 2.275). The service sector, manufacturing, and construction offer similar opportunities (index values in the 0.9 to 1.0 range). Mining and agriculture offer few opportunities. These results are shown in Table 14.

LEVEL OF TRAINING IN THE PITTSBURGH AREA

Estimates of the level of expenditures and number of workers receiving training in the Pittsburgh area do not exist. We asked several employers for estimates of their training budgets. They were unable to provide an estimate, even when the organization had a formal training department. Thus, we relied on the above surveys of national-level data. We estimate, as detailed in Appendix A, that the private sector spent approximately $390 million in 1988 for formal employee training including both internal and external sources, but not includin facilities construction. This is a very rough estimate. Further

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[4] This survey was based on a mailout to 9,460 firms with 100 or mor employees drawn from Dun and Bradstreet's business directory and *Training* magazine's circulation list. Approximately 1,490 responded.

Table 14

DISTRIBUTION OF TRAINEES BY INDUSTRY

Industry	Trainees % of total	Employment % of total	Index[a]
Services	29.0	29.1	0.996
Manufacturing	21.5	23.5	0.914
Fire	11.6	6.2	1.870
Public administration	13.2	5.8	2.275
Trade	9.7	20.3	0.477
Transportation and public utilities	8.7	7.0	1.242
Construction	2.4	23.5	0.914
Mining	2.4	5.3	0.452
Agricultural	0.3	1.6	0.187
Other	1.2	--	--
Total	100.0	100.0	--

SOURCE: Carnevalle and Goldstein, op. cit.

[a] Index of concentration equals the percentage of trainees divided by the percentage of employment for an indication of how concentrated training is in a particular industry compared to others.

research within the training community is needed to provide better estimates.

We cannot estimate the number of employees trained or the costs associated with informal, on-the-job training. Experts in the field agree that costs associated with informal training equal or exceed those for formal training, but no reliable estimates have been made.

IMPLICATIONS FOR PITTSBURGH

The above national-level information can be applied to the Pittsburgh area to produce the following tentative training forecast for the Pittsburgh area.

First, the average size of firms in Pittsburgh has been decreasing as the economy moves away from large-scale manufacturing toward specialized manufacturing and smaller-scale service firms.[5] This means that the total amount of private sector training offered in the Pittsburgh area might decline as firm size declines. Because of this formal education and training institutions might experience increasing pressure to provide highly specialized training that they have not historically provided. The current increase in customized training offered by public institutions might be a sign of this effect. If training is not provided by formal institutions we can expect the wages offered to trained employees to increase.

Training opportunities will vary by industry. Growth in the finance, insurance, and public sectors and decline in industry and manufacturing in the region has resulted in the former becoming major employers in the area. Currently, the U.S. government, the Commonwealth of Pennsylvania, and Allegheny County rank in the top seven largest employers in the area, together employing almost 40,000 workers.[6] Several financial institutions also rank as large employers. Growth in these sectors, with their emphasis on training, may increase opportunities for entry-level workers in these fields.

Employees entering the high-technology sector may have the best chance of receiving training regardless of individual characteristics. This sector, however, does not employ large numbers of people in the Pittsburgh area and is not expected to grow at a rapid rate.[7]

Those with less education entering below the managerial level can expect fewer training opportunities than those with higher levels of education entering at the managerial level. Young adults who hope for employment and advancement should obtain postsecondary education before entering the job market. Those relying on the private sector for training and advancement with just a high school diploma might be disappointed in the initial level of training offered. In addition, non-white males and all females may be less likely to receive training.

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[5] Thomas Glennan et al., *Education Employment, and the Economy: An Examination of Work-Related Education in Greater Pittsburgh*, The RAND Corporation, N-3007-OERI/HHE, August 1989.

[6] Pittsburgh Business Times, *1988 Book of Business Lists*, Pittsburgh Business Weekly Corporation, Pittsburgh, 1988.

[7] Discussions with officials from the Pittsburgh High Technology Council, an association of area high-technology businesses, indicated that these firms employ about about 6 to 7 percent of the area workforce. Even with explosive growth this sector is not expected to ever employ more than 15 percent of the workforce.

V. SPECIALLY FUNDED TRAINING PROGRAMS FOR TARGETED POPULATIONS

The programs discussed in this section differ from the other components mapped. Unlike secondary vocational education, for example, these programs lack an explicit institutional setting. Instead, these federal, state, and county programs support or expand existing work-related educational offerings in the Pittsburgh region, usually through additional funding sources. They are implemented through the institutions described above, providing educational opportunities to specific disadvantaged populations or employees of marginal firms.

The three programs described here are the federal Job Training Partnership Act, Pennsylvania's Customized Job Training program, and Allegheny County's Dislocated Workers' Educational Training Program and its recent state-funded successor. The programs are treated separately in this map because they have more specific goals than other work-related education and they are funding mechanisms rather than providers. They complicate the map, however, because they present the problem of double-counting: Most of their expenditures and enrollments are already included in figures provided earlier for work-related educational institutions in the region.

THE JOB TRAINING PARTNERSHIP ACT

One of the major federally sponsored fiscal supports for secondary and postsecondary vocational education is the JTPA program established in 1982. That legislation, intended to replace the earlier Comprehensive Employment and Training Act (CETA), established a program financed by a formula grant to each of the nation's governors. The governors in turn oversee locally coordinated job training and placement activities in their states.

The law requires each governor to designate: Service Delivery Areas (SDAs) for each major city and labor market area in the state; state-level program goals; and a formula for allocating federal funds to each SDA. The SDA program sponsor is usually an agency in the city or county government which develops a job training plan for SDA services subject to the provisions of the legislation and the advice of a locally appointed Private Industry Council (PIC). Under that plan, the sponsor contracts with local organizations to provide job training and placement services. Each year the governor evaluates sponsors by the success of their local programs in meeting state goals before making subsequent annual allocations.

The act has three major titles. Congress allocates funds each year for these and other lesser programs within JTPA, and the states are free to supplement those federal funds. Title IIA, the largest, supports services for disadvantaged adults and youth. Sponsors face broad restrictions on use of the title's funds, including requirements that at least 90 percent of program participants be economically disadvantaged, and that at least 40 percent be aged 16 through 21. Sponsors evaluate contractors under IIA largely on program costs per participant and their success at placing participants in private sector jobs. Title IIB, in contrast, supports summer employment and training programs for disadvantaged youth, including 14 and 15 year olds. This title supports broad training for young people, including literacy and basic skills, and allows evaluation on much broader standards, including participants' improvement of reading skills or rates of returning to school. Funds for the above two programs flow directly to program sponsors in the SDAs, largely by formula.

The program operated under Title III, dedicated to dislocated workers, functions quite differently. On one hand, provisions for this title are more restrictive than those for IIA or IIB, allowing governors to run the program only if their states match federal funds dollar for dollar, and requiring specific identification of dislocated workers eligible for the program. On the other hand, Title III enables more discretion in contracting, allowing governors to bypass program sponsors and contract directly with service providers around their states if they wish.

IMPLEMENTATION IN THE PITTSBURGH REGION

The greater Pittsburgh region has been divided into four Service Delivery Areas: Pittsburgh city, Allegheny County, Fayette/Westmoreland Counties, and Washington/Greene Counties. The two we have been most concerned with are the Pittsburgh and Allegheny County SDAs, the latter of which can most easily be described as a donut-shaped jurisdiction around the city. These two SDAs are served by a joint Private Industry Council, but each has a distinct program sponsor and a distinct program approach.

Pittsburgh's JTPA program is sponsored by the city government and administered by the Pittsburgh Partnership, an office of the Department of Personnel and Civil Service. In practice, the Partnership coordinates JTPA with several other federal- and state-supported programs, including Community Development Block Grant (CDBG) activities.[1] The Partnership operates JTPA as one of an array of human services and community development activities, often coordinating it with other services to maximize the impact in the city. For example, the city supports a program for pregnant and parenting teens that provides JTPA-sponsored training along with income maintenance, day care, and other services coordinated through the state's Single Point of Contact (SPOC) human services centers.

The Allegheny County JTPA program is administered by the county's Department of Federal Programs. Many of the policy and contract decisions of the county's program are made by the Department's Office of Planning and Evaluation, subject to the approval of the Board. Like the city, the county coordinates JTPA with a variety of other federal and state programs, although its programs tend to be somewhat more narrowly focused on employment and training services.

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[1] This coordination is consistent with practices documented in W. Norton Grubb, Cynthia Brown, Phillip Kaufman, and John Lederer, *Innovation Versus Turf: Coordination Between Vocational Education and Job Training Partnership Act Programs*, a Report to Congress, The Secretary of Education and the Secretary of Labor, National Center for Vocational Education, 1989.

The two SDAs' programs are roughly similar, but they have some interesting differences. Their jurisdictions shape their policy orientations. The Pittsburgh program, acting on a policy decision by the late Mayor Richard Caliguiri, particularly targets low-income blacks, welfare recipients, and young people. It does this in part by concentrating on neighborhoods with concentrations of these groups, particularly through neighborhood-based organizations. The county SDA, in contrast, has served youth in larger numbers than the state average, but this program has been less focused on particular populations than the city's.

The programs of both have served thousands of people. Table 15 shows the numbers of participants for Title IIA and IIB programs in Pittsburgh and Allegheny County as well as the other counties in the region for 1987-1988. As funding has fluctuated since the program's beginning in 1983, the numbers of participants have varied slightly, but the size of the program has remained relatively stable over the last four years. Because it is based on a formula grant, however, program sponsors predict that the level of JTPA funding available to the Pittsburgh region will decline as regional unemployment declines slowly in coming years.

In targeting services to particular groups, the two program sponsors have been constrained by the act's provision restricting costs per participant. Both have supported a wide array of services to diverse populations, recognizing that those services would have divergent costs. A low-income dropout minority youth with little job experience, for example, would require long-term and expensive training and services to find a job, whereas an experienced, laid-off mill worker may require only some brief and inexpensive help sharpening his or her job search skills. Although the former services cost far more than the allowable median per participant, the latter cost far less. Program managers at both the city and the county, therefore, have tried to balance more expensive contracts with cheaper ones to produce median costs within allowable limits. This has become somewhat more difficult for the county program, where the number of laid-off workers needing

Table 15

JTPA PARTICIPANTS, PITTSBURGH REGION SDAS

(With selected demographic characteristics, 7/1/87 through 6/30/88)

Area	Title IIA (Disadvantaged) Adults and Youth	Title IIB (Summer Youth)
Pittsburgh SDA		
Total	2,470	1,573
Minority	1,963	1,420
21 and under	1,076	
Allegheny County SDA		
Total	5,676	2,472
Minority	2,397	1,127
21 and under	2,733	
Westmoreland/Fayette SDA		
Total	3,367	1,356
Washington County		
Total	766	641
Total participants	12,279	6,042

SOURCE: Pennsylvania Department of Labor and Industry reports.

relatively short-term and inexpensive services has declined since the worst of the 1982-1983 recession.

The two jurisdictions have consistently differed on their contracting methods and the kinds of education providers they have supported. The Pittsburgh Partnership has done virtually all its contracting on a "performance" basis. That is, it has contracted to pay trainers for services on the condition that the trainers fulfill an agreed set of performance standards (for example, rates of participant completion or rates of successful job placement on completion). Such contracts tend to exclude tuition-charging institutions like the community college or proprietary schools, which need their funds up front and must be assured of full payment. As a result, although the city does contract regularly with the Pittsburgh public schools for classroom education, it has relied more heavily on community-based organizations (CBOs) like the Bidwell Center and the YWCA for its training. In addition to simply providing training, this CBO focus complements the city's neighborhood strategy. For example, by working with the North Side Association to set up a North Neighborhood Center that provides JTPA services and referrals in that predominantly black neighborhood, the city reaches one of its targeted populations.

The county, in contrast, uses a variety of different contracting methods and follows different contracting patterns. They have been far more willing to negotiate contracts that pay out a fixed level of funds on the front end, and as a result have worked much more frequently than the city with the Community College of Allegheny County and the region's proprietary schools. CCAC offers the added advantage of having publicly subsidized tuition for county residents, which reduces costs per participant. The unsubsidized proprietary schools, on the other hand, tend to be more expensive on a per participant basis. Surprisingly, proprietary schools are the most common type of contractor under the county's IIA program. Program administrators explain that these schools' high placement rates make the costs worth bearing.

Total funding for the two central SDAs peaked in 1985-1986 at $12.4 million for Title IIA and $5.8 million for Title IIB. It has declined to $7.3 million and $3.7 million, respectively, for the current program year and will decline further in coming years if the region's economy continues to recover.

DISPLACED WORKERS PROGRAM

In addition to JTPA's Title III, two publicly sponsored dislocated workers programs have been offered in Allegheny County since the 1982 recession began. The first, the Dislocated Workers' Educational Training Program, ran from mid-1983 through mid-1987, sponsored by the Community College of Allegheny County and funded by the county. That program covered educational costs for displaced workers wishing to enroll in CCAC for occupational training or further education. Allegheny County residents who were laid off from a designated set of plants could enroll in the program from mid-1983 through mid-1984 and continue at the college until they found full-time jobs or finished their courses of study.

More than 10,000 people applied for the program.[2] Only a fraction were found ineligible. About 7,300 (77 percent of those found eligible) ultimately enrolled in a variety of courses at CCAC. Of those, nearly 70 percent found full-time jobs and 84 percent found full- or part-time jobs related to the training they received from CCAC. Through April 1987, the program cost $8.4 million, $5.2 million of which was paid directly by the county (the remaining $3.2 million came from unspecified sources). The average cost per participant was about $1,200.

There has been no systematic study of who the program's participants were, but CCAC has published a survey of those who applied. Most, 73 percent, were men who were between 25 and 35 (the median age was 31). The profile does not break down the applicants by race. Although Pittsburgh city has only about a quarter of the population of Allegheny County, nearly half of the applicants were from Pittsburgh. More than 95 percent of the applicants had a high school diploma, and nearly 30 percent had previously attended CCAC.

The initial county Dislocated Workers Program expired at the end of the 1986-1987 academic year. In spring 1988, CCAC convinced state officials to release an additional $1.1 million to fund a second program called Workers in Transition. The funds--$300,000 from the state's JTPA Title III allocation and $800,000 from the state's pool of federal Perkins Act retraining dollars--will subsidize a program very similar to the earlier Displaced Workers Educational Training Program. The college will enroll unemployed Allegheny County residents and cover their tuition, fees, and book costs for whatever program of study they choose. The funds are guaranteed only for the 1988-89 academic year, but the college hopes to continue the program through 1989-1990 so enrollees will have an opportunity to complete an associate degree.

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[2] Community College of Allegheny County, *CCAC Update: Dislocated Workers' Educational Training Program*, 1987.

CUSTOMIZED JOB TRAINING PROGRAM

Customized Job Training (CJT) refers to any program run by a work-related education provider that provides firm-specific training. In short it is a cooperative effort by providers and private sector firms to provide the specific training required by that firm's employees. The provider often develops specialized coursework and materials on a customized basis with input by the firm. Classes can be held at the provider's normal site or on-site at the firm. Course completion may result in certification, course credit, a credential, or simply a better trained employee. Two types of CJTs are evident in the area: state-sponsored programs and non-state-sponsored programs.

State-Sponsored Program

In 1982 the Pennsylvania legislature created a CJT program, which established a pool of $1 million to subsidize training for employees of private firms in the commonwealth. The training was to be provided on a contract basis by educational institutions designated by the Pennsylvania Department of Education, and customized to the needs of the firms. Several kinds of firms (and, implicitly, employees) were targeted: (1) new start-up businesses or firms relocating from outside the state; (2) firms in economically distressed areas; (3) firms demonstrating a commitment to retain endangered jobs or expand their hiring; and (4) manufacturing firms as opposed to retail or service firms. The training would be subsidized on a first-come, first-served basis and the program would be reevaluated each year for further funding.

Over the next six years, the legislature expanded CJT quickly into a $15 million program in 1988, reaching 52 of the state's 67 counties.[3] By 1985 the Department of Education had designated the current pool of 89 AVTS, 14 colleges and universities and several proprietary schools as contractors for the training. Between 1982 and 1987, CJT subsidized training to more than 50,000 people throughout the state, at a median cost of about $1,300 per trainee for several months of training.

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[3] This and much of the following information is drawn from an interview with Ronald J. O'Brien, Pennsylvania Department of Commerce, Harrisburg, July 1988.

Although support for the program appears to be staying strong, the state's handling of it has changed in the last year. The program has never been audited systematically, and incidents of fraud and abuse have been reported around the state. Further, questions have been raised about whether the public should subsidize employee training in private, profitmaking firms. In response, the legislature passed more specific criteria and more stringent regulations to account for CJT funds administered by the Department of Education. Aside from an effort to avoid fraud, the new requirements are primarily intended to focus CJT and to spur job creation and useful employee training over the longer term.

Non-State-Sponsored Programs

In addition to the state-sponsored program, providers have acted in their own interests to opportunistically offer CJT courses. They have worked with local firms to develop and offer courses outside the state program. The provider charges cost plus a profit for these offerings to the interested firm. Despite these costs, it is still less expensive for firms to use existing providers than to provide the training themselves. The providers benefit not only from revenues and enrollments, but from keeping their own instructors up to date on new techniques and equipment. The community colleges and proprietary schools offer these CJT courses and have actively sought interested firms outside the state program umbrella. When offered by state or locally supported providers, outside the specific state CJT program, firms still receive a subsidy for training because their employees are often charged cost less the normal student state and local subsidy. It is unclear if the firms always pay the program costs or if their employees sometimes pay for the costs of training.

In the Pittsburgh region, CJT services of both kinds have been provided by the full range of possible contractors. Those involved in the state program received Department of Education certification in 1984 or 1985. The Community College of Allegheny County and California State University in Washington County appear to be the largest providers. However, because of the lack of oversight it has been very difficult to get data on enrollments in these programs. The CCAC has the most complete documentation and we use it as an example.

CCAC has dedicated two or more full-time staff to CJT since it began offering CJT in mid-1985. The staff have served in a brokering role, contacting local firms and offering to arrange subsidized job training for their employees at the firms' convenience. The program is still growing, from about 500 persons trained in 1985-1986 to about 1,600 in 1986-1987. As elsewhere, the program has subsidized more "upgrading" training for workers on the job rather than "retraining" workers for new jobs. CCAC's balance has roughly paralleled the statewide balance between the two activities at about four to one.

Recently, CCAC deemphasized its CJT program. CCAC reduced its reliance on the state CJT funds, requesting these funds only when a firm requested the subsidy. Instead it developed non-state-sponsored courses subsidized by regular community college state and county sources. The large increase in fall 1989 enrollments has stressed the funding outlook for the school from these sources. This has resulted in less emphasis being put on activities that do not directly support the primary programs of the school. This is in contrast to the program run by California University, which chose to rely on the state CJT program.

ISSUES ABOUT SPECIAL PROGRAMS FOR TARGETED POPULATIONS

Administrators and researchers in Pittsburgh and elsewhere have raised an array of questions about these funding programs and their implementation.

Concerning JTPA program, one question was raised repeatedly: Is it appropriate to condition funding for means-tested programs on performance standards? In compliance with the federal act, each state's JTPA program has developed an array of performance measures that SDAs must meet to receive funds for their programs. These measures include the proportion of participants who find and retain jobs after completion, the proportion who are on welfare at enrollment, the wages received by participants when they find jobs, and the costs of the program per participant. The federal act provides that the standards associated with the above measures be systematically eased if an SDA serves large numbers of particularly hard to serve populations, including youths under 17, adults over 30, racial minorities, high school dropouts, and handicapped persons. The Pittsburgh region's program sponsors have consistently met Pennsylvania's version of the standards.[4]

Some researchers monitoring the federal program have found evidence that these performance standards discourage SDA program sponsors from serving the most disadvantaged.[5] They argue that program sponsors, fearing loss of funds if they fail to meet the standards, "skim" the targeted population for the least disadvantaged participants to enhance their performance records. In response to such arguments, the state of Pennsylvania this year instituted additional performance standards mandating service to long-term AFDC recipients, teen parents, and school dropouts receiving welfare. The Pittsburgh-Allegheny County Private Industry Council (PIC) has provided local sponsors with reports showing how their performance standards are affected by enrollment of these targeted populations, and exploring the potential impact of these new state standards.[6]

A related concern for JTPA raised by officials in the Pittsburgh region is the effect different forms of contracting have on program costs, providers, and participants. The Pittsburgh SDA, with its reliance on performance contracting, implements its program through a very different set of providers than the Allegheny County SDA, which uses several different contract procedures. For example, as we noted above, the Allegheny County program often contracts with the community college and proprietary schools, whereas the Pittsburgh program has virtually no such contracts. The Pittsburgh-Allegheny County PIC is beginning research on whether these practices result in systematically different kinds of services or draw systematically different kinds of participants. Options such as vouchers to allow participants to choose their providers have been proposed.

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[4] See National Commission for Employment Policy, *JTPA Performance Standards: Effects on Client Services and Costs*, Washington, D.C., 1988.

[5] See, for example, Sar Levitan and Frank Gallo, *A Second Chance: Training for Jobs*, W. E. Upjohn Insitute for Employment Research, Kalamazoo, Michigan, 1988.

[6] Rob Rogers, "Issue Brief No. 88-2: Overview of Performance Standards," Pittsburgh-Allegheny County Private Industry Council, September 1988.

The Displaced Workers programs offered at the Community College of Allegheny County drew widespread praise from people we spoke with in the region, who were impressed with the college's responsiveness and flexibility in admitting a large influx of new students. Because of the program's apparent success, several people raised questions about whether it could serve as a model for expansion or emulation by other providers. On one hand, the placement rates of the program's completers have been quite high and suggest that the program was productive and cost-effective. On the other hand, the program's applicant profile suggests that the participants were disproportionately young, male, and well educated compared to the general unemployed population in the region.

Related research suggests that these applicants (and the enrollees as well) constitute the segment of the unemployed population who were most able to use such services effectively in shifting to alternative occupations.[7] A similar program by another provider or a broadening of the program at CCAC to include less promising applicants may not succeed to the same degree. The issue is being tested this year in a second displaced workers program at the college.

The Customized Job Training Program raised a different set of concerns. People we spoke with acknowledged that the program provided relatively inexpensive training for workers, but some remained troubled that the vehicle for this training was an indirect subsidy to selected private firms in the region. Perhaps such a subsidy is necessary as an economic development tool in competition with other states that also offer training subsidies. But a wide array of private employers in the region provide employee training without receiving the program's public subsidies, and they compete with these subsidized firms. In the context of such unsubsidized private training and the constrained resources available for public and private trainers, the growth of this program is likely to remain an issue.

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[7] Arnold Katz and Frederick J. Tannery, "Adjusting to Structural Change: A Profile of the Work Experiences and Earnings of Dislocated Workers in the Pittsburgh Region, 1979-1986," paper prepared for the University Center for Social and Urban Research, University of Pittsburgh, January 1988.

All of the above issues may be subsets of a larger concern voiced in interviews. Some saw the major problem with these programs as the lack of any strategic planning and sustained funding to enable them to successfully coordinate the programs for targeting specific groups. Attempts at serving the special groups involved have been erratic because of the fluctuations in public funding. JTPA has been affected by drops in funding and the different programmatic choices made by the different SDAs involved in response to these declines. The Displaced Workers Program has been a sporadic, reactive response to a continuing problem. The CJT program, although more sustained in terms of state funds, has struggled to gain a solid foothold. Taken together, these funding efforts do not represent a well-thought-out, coordinated approach. A major policy question is whether a more sustained effort focused on a few special-needs groups in the area might produce more satisfying results.

VI. IMPLICATIONS OF MAPPING

This section summarizes our map of the Pittsburgh work-related education system and raises possible issues for a community-based planning effort to improve that system.

SUMMARY OF THE PITTSBURGH WORK-RELATED EDUCATION MAP

We divided the work-related educational system in Pittsburgh into three institutional sectors: (a) formal secondary providers, which include the public high schools and private high schools; (b) formal postsecondary providers, which include state and state-related colleges and universities, private colleges and universities, community colleges, proprietary schools, adult education programs, and apprenticeship programs; and (c) informal postsecondary providers, which include all firms offering job-related training. We call the first two sets of institutions "formal" because they provide formal credentials to people who complete their programs; the final, "informal" set does not.

In addition to these institutional providers, several governmental programs contribute substantial resources to work-related education in the region. The federal Job Training Partnership Act (JTPA), local Displaced Workers programs, and state-sponsored Customized Job Training all fund education and training for specially targeted groups.

Tables 16 and 17 summarize several important aspects of the work-related educational system in the Pittsburgh region. We note the numbers in the tables are estimates based on limited data and necessarily rough estimation techniques.

Relative Size of Provider Groups

In expenditure terms, employers constitute the largest of the three sectors. Our estimates show that these informal postsecondary providers account for about half of the region's work-related training expenditures. The formal secondary sector accounts for about 33 percent and the postsecondary sector accounts for about 18 percent of all expenditures.

Table 16

ESTIMATES OF PROVIDERS AND ENROLLMENTS, 1985-1986

	Number of Providers	Total Enrollments	Voc. Ed. Enrollments
Formal, secondary			
Public	80	101,900	31,000
Private	74	11,300	0
AVTS[a]	12	(8,500)	(8,500)
Formal, postsecondary			
State	6	38,600	1,400
Private	12	28,800	450
Community college	2	21,700	13,000
Proprietary	70	16,900-19,300	16,900-19,300
Apprentice	450	3,400	3,400
Adult	n.a[b]	n.a	5,300
Informal, postsecondary			
Private firm	n.a	n.a	n.a

[a] AVTS students attend the public high schools and should be counted separately.

[b] Not available or not applicable.

We were unable to estimate the enrollments in the employer sector. Among formal providers, the number of vocational enrollees at the secondary level is about 31,000; the number of postsecondary enrollees is somewhat larger, at a minimum 35,000.

Secondary Level

Public schools provide the only work-related education available at the secondary level. Of those schools, area vocational technical schools (AVTS) serve about 27 percent of all vocational students.

- The region's secondary work-related education is greatly fragmented, with 80 public school districts ranging in size from less than 1,000 students in grade K-12 to close to 40,000.

Table 17

EXPENDITURES ON WORK-RELATED EDUCATION PROGRAMS IN THE PITTSBURGH REGION[a]

(1985-1986)

	Expenditures $M	Percent of Total Expenditures
Formal, secondary	(182)	(33)
Public	182	33
Private	0	0
Formal, postsecondary	(100)	(18)
State	4	1
Private	1	0
Community college	32	6
Proprietary[b]	59	11
Apprentice	0	0
Adult	4	1
Informal, postsecondary	(267)	(49)
Private firm	267	49
Total	549	100

[a] Include expenditures on all activities related to receiving a credential or required by a firm. For the formal providers it includes cost associated with vocational students enrolled in general or academic courses.

[b] Based on lower bound of enrollment estimate of 16,900 and expenditures for certificate and diploma programs at three-fourths that for associate degree programs.

- These districts vary widely in the financial resources they commit to education. Communities at the lower end of the scale are either unwilling or unable to spend money on their schools.
- Because placement and work opportunities will be severely limited for people without high school diplomas, dropout rates in the region's public schools suggest that many people in the workforce will lack the minimum skills they need to find jobs. With their higher dropout rates, black males will be particularly hard hit.

- Increased state graduation requirements have strongly affected vocational students, particularly those who attend AVTS. The requirements make it more difficult for vocational students to complete both required general education courses and their vocational programs. Juggling these requirements has become particularly difficult for AVTS students, who must spend some of their school time commuting.

Formal, Postsecondary Providers

Community colleges and proprietary schools provide most of the region's formal postsecondary occupational education. Surprisingly, proprietary schools enroll more vocational students and have larger vocational expenditures than the community colleges. Using our definitions, private colleges play a very small role in providing work-related education.

Informal, Postsecondary Providers

On-site training by employers accounts for about half of the expenditures on work-related education in the region. (The share would grow if we counted employer subsidies of students in the formal educational institutions as well.) However, these expenditures do not generally present strong training opportunities for unskilled workers or those new to the work force because employers tend to provide training for those with higher levels of education and experience.

Changes in the regional economy will affect the training provided by this group. In particular, the downsizing of the average firm in the area may indicate that fewer private training opportunities will be available in the future.

Special Funding for Targeted Populations

Federal, state, and local governments have created programs to support work-related education and training opportunities for targeted populations. These programs, which include JTPA, local Displaced Workers programs, and state-sponsored Customized Job Training, have become integrated into the system as they have subsidized education and training provided by the region's formal secondary and postsecondary institutions.

The largest program, JTPA, provided $12 million in funding to the region in fiscal year 1986. It supported training for more than 18,000 disadvantaged persons in fiscal year 1988. The Displaced Workers programs offered at the Community College of Allegheny County and the state's Customized Job Training program are also substantial providers of funding for vocational education of special populations. Some controversies remain over the purposes and performances of these programs.

Geographic Location of Providers

Most institutions that provide work-related education are centered in Allegheny county. Students at the secondary level are heavily concentrated there as well, although the city of Pittsburgh accounts for only about 15 percent of secondary students in the region. Formal postsecondary providers of all kinds are even more heavily concentrated in Allegheny with very few outside the county. The distribution of firms providing informal postsecondary training is also concentrated in Allegheny County (over 69 percent).

COMMUNITY-BASED PLANNING ISSUES

The features of the Pittsburgh region's work-related education system, as mapped in this Note, raise several possible issues for community-based planners working to improve the system.

Secondary-Level Fragmentation

The fragmentation of the region's public school systems will complicate any effort to improve work-related education at the secondary level.

First, the many small districts in the region, the curriculum reforms mandated by the state, and sustained enrollment declines threaten the viability of the AVTS and participation in work-related programs.

- Should the funding structure and programs of the AVTS be modified to sustain their education mission?
- Can the Intermediate Units provide a forum for improved planning of work-related education throughout the region that counters the problems related to small district size and fragmentation?

Second, despite the fact that the city of Pittsburgh has only 15 percent of the region's secondary students, it has consistently been able to attract the lion's share of private, state, and federal discretionary funding to support program development and improvement. Fragmentation makes it difficult for other districts in the region to gain a commensurate share of these resources.

- Does Pittsburgh's success reflect greater needs on the part of its students? Or are smaller districts unable to organize to seek such resources and to develop programs to use them?
- Assuming that wider participation of school districts to improve work-related education develops, what mechanisms might be used to attract additional funds to the region?

The Role of Employer Training in the Region

About 50 percent of the regional resources expended in work-related education activities are expended by employers. Any serious effort to improve the system must take these efforts into account.

First, employers tend to offer training opportunities to their more educated and experienced employees. This raises questions about who will receive employer training within firms.

- Are the region's school systems producing students in whom employers will want to invest? Are high school students being adequately counseled to prepare themselves to gain access to employer-based training opportunities?

- Are the programs dealing with special populations such as dropouts, teenage parents, unwed mothers, and the economically and educationally disadvantaged providing skills that will ultimately give them access to these training opportunities?

Second, it raises questions about the future. The average size of employers in the Pittsburgh region is decreasing. National research suggests that smaller employers tend to provide less training.

- Are the national trends mirrored in Pittsburgh? Are employers in the region providing fewer training opportunities than they once did?
- Have education and training institutions developed programs that can replace lost training previously provided by employers? Should they?
- Is education and training for adults available at affordable costs for the less skilled portions of the labor force if their employers will not train them?
- Are the growing customized job training activities simply displacing training funds that would otherwise be spent by employers?

The Role of Proprietary Schools in the System

Despite significantly higher tuitions, our estimates show that the region's proprietary schools draw more students than its community colleges. This does not necessarily indicate a problem, but it does raise several questions:

- What are the features of the proprietary schools that make them as attractive as they appear to be?
- Are the economically less-well-off members of the community restricted in their capability to make use of training opportunities in the proprietary schools?

The Future of JTPA

The federal Job Training Partnership Act has played a growing role in both secondary and postsecondary work-related education in the region. But the program continues to evolve and presents several issues:

First, the amount of funding for JTPA programs in Allegheny County declined by 40 percent between 1986 and 1988. This decline stems in part from changing national funding for the program but also from formula-driven cuts as Pittsburgh's unemployment rate decreased.

- Did the need for the programs supported by these funds decline comparably over the same time period?
- Are the actions taken by the region's work-related education providers to cope with these funding reductions effective?
- Are actions to better serve the clients of the JTPA program necessary? Are they possible?

Second, the Pittsburgh JTPA program makes nearly exclusive use of performance-based contracts for its programs, whereas the Allegheny County JTPA program uses relatively few. Performance contracts are said to promote "skimming" but also to provide stronger incentives to effective performance.

- Do the differences in the target populations and program strategies of the two SDAs merit the different approaches?
- Are there reasons for one or the other SDA to change its policy?

Demographic Change

The supply of older, underemployed workers remaining from the structural shifts of the economy in the early and mid-1980s is declining along with the number of young initial entrants into the labor market.

- Are the education and training institutions of the region anticipating this change and preparing programs to deal with it?
- Do these changes provide opportunities for enabling the youth who have not done well in the schooling and training system to obtain more useful and fulfilling work? What needs to be done to help them take advantage of such opportunities?

Economic Change

The occupational structure of the region has changed significantly over the past decade with the growth of services and trade and the decline in manufacturing industries.

- Have the curricula and programs offered in the region's high schools and community colleges changed sufficiently to meet the need for new occupational skills?
- Do the skill requirements of the growing occupations change the desirable balance between generic work-related skills and occupationally specific skills in the secondary schools?
- Do these same skill requirements make increased coordination of secondary and postsecondary instructional programs desirable?

Linkages Between Informal and Formal Parts of the System

As the region's demographics and economy have changed over the past decade, the various institutions in its work-related education system have struggled to keep up.

- In the context of these changes, do the formal parts of the system have adequate means to know and incorporate employer needs into formal curricula and programs?
- Are formal institutions aware of the immediate posteducational activities of their graduates and do they help students develop skills applicable to those activities?

- Do employers make sufficient input into education program design? Do they hire the people trained in the programs they help design?
- Are there adequate opportunities to receive the training required for new jobs or to upgrade existing job skills?

USEFULNESS OF MAPPING

The uses of this map of the Pittsburgh educational system remain to be seen: Community planners will have to decide whether and how the information can be used. However, the exercise itself has revealed several important problems with data sources:

- The largest group of providers in the system are the private firms in the informal, postsecondary sector. Yet this is also the group of providers that has been the least studied and on which the least amount of information is available. More and better information on the contribution of private firms to work-related training would enable better planning and coordination between the formal and informal parts of the system.
- A second major group of providers--the proprietary schools--has not been studied very much and few data are available on them. Again further work in this area might produce a better understanding of how they function within the system and enable some coordination between different parts of the system.
- Attempts to evaluate the system will necessarily be limited because of data problems. Few follow-up surveys exist on education providers or students, especially at the postsecondary level. In addition, the actual number of students who complete postsecondary programs is unclear. Information on completers, as opposed to enrollees, is essential to a better understanding of the system and its performance.

- Longitudinal data on people moving in and out of the system would offer useful insights for evaluation. Data currently do not support such an effort.
- Similarly, we were unable to provide longitudinal analysis of program or curriculum change, so we cannot assess changes that are being made in response to employment trends. Information is this area would provide much needed insight into how well the system responds to employment opportunities.
- Our simple analysis of revenue sources does not do justice to several issues about the effects of revenues on program offerings and student characteristics. More detailed data that connected revenues and expenditures would help support such analysis.

Appendix A

DATA DEVELOPMENT

The appendix is organized generally by educational provider in order similar to the main text as follows: national level; secondary, formal providers; secondary, formal vocational education providers; formal, postsecondary providers including four-year schools, community colleges, adult education, proprietary schools, and apprenticeship programs; and informal, postsecondary providers. The appendix describes the assumptions and calculations that were made to develop enrollment, expenditure, revenue, and performance data. Most data are for the school year 1985-1986 which is the last complete year of state-level data at the time of writing.

DATA LIMITS AND PROBLEMS

The data available for analysis were limited. Several areas presented difficulties because of lack of data, inconsistent data, or measures inappropriate for our purposes. Four areas were particularly lacking in descriptive data: performance measures for all providers; enrollments and resource data for proprietary schools; participants and expenditures for employer-provided training; and vocational enrollments and expenditures for all providers. In the first area we report only those performance indicators available, but in the next two areas we made arbitrary assumptions to arrive at estimates of enrollments and expenditures. For vocational enrollments and expenditures we made a series of calculations as outlined later.

The area of performance measures for providers was also the area in which data inconsistencies abounded. This was especially so for the few measures collected on secondary providers. State and local sources for graduates, program completers, and post-school employment often reported different figures for the same providers. Discussions with officials at each level indicate this is a result of the use of different definitions and the response rates of surveys.

The appropriateness of measures was most questionable in expenditure data for all providers, especially vocational expenditures. Although total expenditures were available on a per student basis for most schools, seldom were expenditures per vocational student available.

We attempted to develop similarly based measures for each type of provider using the following definitions and guidelines.

- Total Expenditures. Equal the total cost of educating a student including all general fund expenditures such as current expenditures, capital outlays, and debt service.
- Current Expenditures. Equal the total of instructional, support and administrative services, and noninstructional services.
- Instructional Expenditures. Equal the costs of activities directly attributable to the interaction of teachers and students for a program of study. The largest components of instructional expenditures are teachers' salaries and benefits followed by classroom materials. Instructional expenditures can be further divided by general program area: general or regular instruction, vocational instruction, and special education.
- Support, Administrative and Noninstructional Services Expenditures. Equal different categories depending on the provider. In general this category: operation and maintenance; administrative and support personnel salaries; research and development costs; curriculum or program development; library, housing, medical, and cafeteria costs; etc.

We attempted to establish a measure for funds expended on vocational programs--one that educators, trainers, regulators, and others agree is necessary to develop competencies associated with a vocational degree, diploma or certificate, or credit course. These expenditures should include direct costs of vocational instruction, direct costs of other types of instruction necessary to achieve the credential, plus a pro-rated allocation of the support and administrative costs associated with instruction. To be consistent the costs of vocational programs across providers should include:

1. Vocational instruction expenditures per vocational student.
2. Other necessary instruction expenditures per vocational student.
3. Administrative and support expenditures per vocational student.

Some costs should not be included because they are attributable to the continuance of the institution as a whole, not to a specific course of study. These costs include, but are not limited to capital outlays, debt service, research and development costs, and facilities maintenance costs.

However, data availability was limited. We could not, in many cases, distinguish between vocational and general instructional costs, or the administrative or support costs associated with vocational activities. Thus, we were sometimes forced to use higher levels of aggregation.

To avoid inconsistencies and to ensure common measures as much as possible, a major decision was made early on to rely heavily on state-reported data. State reporting requirements ensure that the data are based on common assumptions and definitions. However, state data may be outdated or somewhat misleading from a local perspective. Thus, we supplement the state data with local-level data that may be based on different assumptions or definitions. When doing so we attempt to caution the reader in this regard.

NATIONAL-LEVEL SCHOOL DATA

All national-level data presented in the main text came from publications of the Center for Education Statistics, U.S. Department of Education.[1] No manipulations were made on these data.

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[1] *Digest of Education Statistics, 1987*; *Digest of Education*

SECONDARY, FORMAL PROVIDERS

Enrollments

Public providers and their enrollments were identified using state sources.[2] Private schools and their enrollments came from similar sources.[3] Additional information on Catholic schools was obtained from the Diocese of Pittsburgh.[4]

Resources and Expenditures

Information on public school revenues and expenditures came from state data.[5] When providing general expenditure data for the secondary level we used weighting techniques to account for the fact that expenditures per student in grades 7-12 are 1.36 times greater than expenditures per student in grades K-6 as noted in the data sources (see Table 3 in the text). Thus, general instructional and current expenditure data represent average expenditures for grades 7-12. Similar information on Catholic schools was not available from the Diocese of Pittsburgh. Because these private schools have few vocational students we did not pursue other data sources.

Performance

Performance indicators came from a variety of sources. Public school dropouts, graduations, and after-graduation activity came from state sources.[6] Pittsburgh-specific information was obtained from the

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Statistics, 1985-86; *The Condition Of Education*, 1986; *The Condition of Education*, 1987.

[2] Pennsylvania Department of Education, *Summary of Enrollments in Public Schools, 1985-86*, 1986; and *Summary of Enrollments in Public Schools in Pennsylvania, Fall 1975*, 1976.

[3] Pennsylvania Department of Education, *A Listing of Pennsylvania Non-Public Schools Having Secondary Enrollments, 1975-76*, 1976; and *A Listing of Pennsylvania Non-Public Schools Having Secondary Enrollments, 1985-86*, 1986.

[4] Anne Marie Catanzaro, Diocesan Secondary Educational Consultant, Catholic Schools Office, Diocese of Pittsburgh.

[5] Pennsylvania Department of Education, *Selected Revenue Data and Equalized Mills for Pennsylvania Public Schools, 1984-85*, 1986; and *Selected Expenditure Data for Pennsylvania Schools 1984-85*, 1986.

[6] Pennsylvania Department of Education, *Dropout Rate by School District, 1985-86*; *Public School Dropout Report 1986-86*, 1988.

Office of Vocational Education of the city of Pittsburgh. Private school information was obtained from state data and the Diocese of Pittsburgh.

SECONDARY, FORMAL VOCATIONAL EDUCATION

The state and local governments collect less information on the specific number of students involved in vocational education; therefore, we relied more heavily on estimation techniques.

At the secondary level, we had state information on numbers of students in vocational programs and total students for 1986-1987 in the public schools. To determine vocational students in 1985 we multiplied the 1986 ratio of vocational students to total students times the total number of students in 1985. This equaled 31,000 students.

Interviews with both private and public secondary school officials indicated that private schools in the area do not offer vocational courses. We have, thus, assumed that no private school students attend vocational courses.

We estimated vocational program expenditures per student at the county level using the following guides:[7]

1. Vocational instruction expenditures per student = total voc-ed instruction expenditures ÷ number of vocational students.
2. Other instructional expenditures per student = (instructional costs per credit hour in nonvocational courses) x (average number of nonvocational hours per vocational student).
3. Support expenditures per student = (support services + noninstructional services expenditures) ÷ total number of students.

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[7] All data come from Pennsylvania Department of Education, *Selected Expenditure Data for Pennsylvania Schools 1984-1985*. Vocational instruction equals vocational instruction expenditures as shown in Table 3. Nonvocational instructional costs included regular, special education, and "other" instructional cost categories of Table 3 in the source. Support cost are taken from Table 2A in the source.

These three types of expenditures per pupil by county were added together to get total vocational expenditures per vocational student by county and multiplied by the number of vocational students per county.

Other instructional expenditures data included expenditures for vocational and all other students enrolled in general courses. In estimating Eq. (2) we had to estimate the number of credit hours vocational students took in vocational rather than other instruction to properly account for those hours of nonvocational instruction taken by vocational students. We assumed that all students enrolled in seven annual credit hours per year. On average vocational students took five regular and two vocational credits per year and nonvocational students took seven regular courses. Credit hours and their costs were weighted in this manner.

We estimate that the total program expenditures associated with vocational students was $182 million in 1985.

POSTSECONDARY, FORMAL: FOUR-YEAR SCHOOLS

Enrollments and trends for higher education institutions come from state data sources.[8]

Revenue and expenditure data came from state data sources as well. Detailed information from these sources is shown in Tables A.1 and A.2 along with data sources. Tuition charges also came from state data.[9]

We estimated the number of vocational or occupation students in the following manner. First, we assumed that any education beyond the two-year level could be considered nonvocational. For the four-year institutions, we determined from state sources and school officials which offer certificates and associate degrees. Four of the state institutions and two private colleges do. All others offer only four-year degrees, therefore, we did not consider them further.

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[8] Pennsylvania Department of Education, *Higher Education Fall Enrollments, 1987*; *Higher Education Summer and Fall Enrollments, 1985*; *Our Colleges and Universities Today: Summer and Fall Enrollments, 1980*.

[9] Pennsylvania Department of Education, *Basic Student Charges and Tuition of Higher Education, 1987-88*.

Table A.1

HIGHER EDUCATION REVENUES SOURCES, 1985-1986

(Percent by source)

	Tuition and Fees	Federal	State	Local	Private	Sales[a]
State system	23.8	8.2	55.1	0	0.5	12.4
State related	23.8	15.5	26.1	0.3	9.1	25.2
Community college	25.9	11.9	30.7	22.1	1.0	8.3
Private college and university	42.1	17.7	2.4	0.1	18.4	19.3
Special associate degree	75.3	12.2	3.1	0.0	2.4	7.1

SOURCES: Pennsylvania Department of Education, *Higher Financial Statistics, Current Fund Revenues by Source for Fiscal Year Ending 1986*.

[a] Many four-year schools collect revenues from sales of educational materials or by-products of the education process.

Table A.2

HIGHER EDUCATION AVERAGE EXPENDITURES, 1985-1986

(In dollars)

	State System	State Related	Community College	Private College and University	Special Associate Degree
Average instructional expenditures/FTE	3,094	2,866	1,961	3,248	1,186
Average current expenditures/FTE	7,538	7,387	4,735	11,931	4,123

SOURCES: Pennsylvania Department of Education, "Higher Financial Statistics Current Funds Expenditures and Mandatory Transfers for Fiscal Year Ending 1986," computer printout.

Of the state schools that offered certificates or two-year degrees we assumed that the number of certificate and associate degrees awarded compared to the number of bachelor degrees awarded would be a good indicator of the ratio of vocational to all undergraduate students. However, it takes two years to complete an associate degree and four to complete a bachelor's degree. Therefore, the ratio should be the number of associate degrees divided by twice the number of bachelor's degrees. This gave us 2,191 students. We estimated that only 60 percent of these students were in occupational courses--about 1,300 students.[10] We multiplied this vocational enrollment estimate by the full-time equivalent ratio (FTE/total enrollments) for each school to obtain an estimate of the number of full-time-equivalent students in vocational or occupational programs--1,000.

We called the two private schools and received estimates of their vocational enrollments which totaled 450. School officials could not tell us if vocational students were more or less full-time than the average student. Therefore, we multiplied vocational enrollments by the reported FTE ratio for each school giving a final estimate of 305 FTE vocational students from private colleges.

Thus, we estimate that total vocational FTE enrollments in four-year institutions equaled 1,305, or about 1,300 in 1985.

At the postsecondary level it is not possible to distinguish between vocational and other instructional expenditures. Therefore, we estimate expenditures using average expenditures per FTE student times the number of FTE students. For the state and private schools the relevant expenditures per vocational student equal:[11]

1. Instructional expenditures per FTE = (instructional cost + academic support + student services) ÷ total FTE.

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[10] The 60 percent is the same ratio as that found in the community colleges of occupationally oriented associate degree students to all associate degree students.

[11] This method removes irrelevant costs such as research, public support, and operation and maintenance from consideration.

2. Support expenditures per FTE = [[(institutional support cost) + (instruction costs)] ÷ (total cost - institutional support costs)] ÷ total FTE

These two types of expenditures per FTE were added together for each institution to arrive at an average program cost per FTE. This cost was then multiplied by the number of FTE vocational students at the school to arrive at an estimate of vocational FTE student expenditures. We estimated that expenditures for vocational students in 1985 were $4 million for the state colleges and $1 million for the private colleges.[12] Using this method based on total instructional costs may underestimate vocational expenditures if, as with secondary schools, vocational courses cost more than academic courses.

FORMAL POSTSECONDARY: COMMUNITY COLLEGES

The City College of Allegheny County (CCAC) informed us that 60 percent of its students were considered in occupational courses that ended with an associate degree. We used this as an estimate for Westmoreland Community College vocational enrollments as well. Thus, our estimate of vocational enrollees for these two colleges is equal to 60 percent of their enrollments or 13,040.[13] We applied each school's reported FTE ratio to this number to get 8,608 or about 8,600 FTE vocational students.

We estimated expenditures for the community colleges in a similar manner to those for state and private schools. We estimated that vocational expenditures in 1985 were $32 million.

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[12] Pennsylvania Department of Education, *Higher Financial Statistics Current Funds Expenditures and Mandatory Transfers for Fiscal Year Ending 1986*.

[13] Pennsylvania Department of Education, *Higher Education Fall Enrollments, 1985*.

FORMAL POSTSECONDARY: ADULT EDUCATION

Enrollee data for students in vocational adult education come from state data sources but are for the 1986-1987 school year. All students in these courses can be considered vocational. These data are shown in Table A.3.

Data are not available on the expenditure per student for adult education; therefore, we estimated it. We assumed that the expenditure is approximately equivalent to the expenditures for a vocational student at the secondary level where much of adult education is taught. However, these expenditures are for a seven-hour-a-day student. This must be reduced to the equivalent of the part-time load common for adult education attendees. We assume that an adult education student takes one hour of instruction per night. Therefore, we divide the vocational education costs of a secondary student by seven to arrive at a per adult cost of adult vocational education. We estimate total expenditures by multiplying the average vocational expenditure (divided by seven) per student in a county by the total number of adult vocational students in the county. This equals $4 million.

FORMAL POSTSECONDARY: PROPRIETARY SCHOOLS

We used the *Vocational Resource Directory*[14] to identify the proprietary institutions.

All students attending the proprietary schools, whether in two-year degree programs or certificate and diploma programs, are vocational by our definition. Thus, there is no difference between total enrollments and vocational enrollments for these schools.

Data on enrollments in other schools, on enrollments in certificate and degree programs, and on expenditures are not centrally collected by any source. Furthermore, individual schools do not report these data in their catalogues. Therefore, we were forced to use estimation techniques to set ranges on the enrollments. The estimates are very tentative and should be used with care. Enough information is provided

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[14] Western Pennsylvania Advanced Technology Center, 1984.

Table A.3

VOCATIONAL EDUCATION ADULT ENROLLMENT AND EXPENDITURES, 1986-1987

Area	Enrollment 1986	1985 Expenditure/ Student[a]
Allegheny	2,156	970
Fayette	791	652
Washington	588	666
Westmoreland	1,763	641
Region	5,298	n.a.
State	78,859	n.a.

SOURCES: Enrollments are from Pennsylvania Department of Education, Division of Data Services, *Vocational Education Management Information System, 1984-85*. Costs are from Pennsylvania Department of Education, *Selected Expenditure Data for Pennsylvania Schools, 1945-85*. National Education Association, *Estimates of School Statistics, 1986-87*, p. 7, and *Ranking of the States, 1986*, p. 53, for inflation rates.

[a] Estimated vocational program expenditures per 7-12 grade pupil in 1984-1955, inflated by 1.07 percent and divided by seven to reflect the part-time nature of adult education attendees.

n.a.: not available.

below so that the reader can vary our assumptions as deemed appropriate. This is clearly an area where additional research is needed.

Proprietary enrollees are estimated using a combination of state data sources for those in the 18 schools offering special degrees, the *Book of Business Lists* for the 25 largest schools, and estimation inferences for the 35 schools that have 170 or fewer students.[19]

To estimate enrollments we extrapolated information provided from several sources. State data show that the proprietary schools that offer specialized associate degrees have 6,603 students or 6,441 FTE enrolled in associate programs in 1985.[16] The 18 schools that offer two-year degrees also serve 2,843 other students by offering certificates and diplomas.[17] We infer that the maximum number of students possibly served is approximately 19,300.[18] We know that 18 of the schools enroll 843 nondegree students. The other schools listed in the *Book of Business Lists* enroll 6,071 students in 35 nondegree programs. The 35 schools not listed in either source have enrollments of under 170 students each according to the *Book of Business Lists*. Therefore, the other 35 schools could enroll a maximum of 5,950 students (170 x 35 = 5,950). This would give us a maximum total enrollment of 19,300 (6,441 + 843 + 6,071 + 5,950 = 19,305). However, it is likely that some of these 35 schools enroll fewer than 170 students. To establish a lower bound, we arbitrarily assume that the 35 schools average 100 students or 3,500 enrollments. This equals a total enrollment of 16,900 (6,441 + 843 + 6,071 + 3,500 = 16,855).

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[19] Pittsburgh Business Times, "25 Largest Pittsburgh Area Private Career Schools," *1988 Book of Business Lists*, Vol. 7, No. 20.

As with enrollment, expenditures per year for the schools can be estimated using inferences based on state data for 1985-1986. Expenditures for special degree courses offered by the 18 degree-granting schools averaged $4,123 in 1985. Here we use all expenditures, because all students are considered vocational. Furthermore, these schools do not have irrelevant categories of costs such as research or public support. For a maximum estimate we multiply total enrollments, 19,300, by $4,123 to get $79.6 million. To get a minimum expenditure we know that the degree students cost $4,123 each or $26.6 million (6,441 x

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[16] Pennsylvania Department of Education, *Higher Education Fall Enrollments, 1985*.

[17] This information comes from subtracting state two-year degree enrollments for these schools from the total enrollments for these schools listed in the Pittsburgh Business Times, "25 Largest Pittsburgh Area Private Career Schools," *1988 Book of Business Lists*, Vol. 7, No. 20.

[18] We note that we use full-time-equivalents for the associate degree students only. State data show that for these students an FTE ratio of 0.975 is appropriate. We assume that the other students are full-time. To apply the 0.975 ratio would only slightly reduce an already major possible estimation error.

4,123 = 26,556,243). We arbitrarily assume that all other students cost one-half that amount each or $2,062 (4,123 ÷ 2 = 2,062) and we use the low enrollment figure of 16,900. This would equal expenditures of $21.5 million ($1,738,266 + $12,518,402 + $7,217,000 = $21,473,668). Total minimum expenditures would equal $48 million ($26.6 + $21.5 = $48.1). To get a more likely estimate we use the same procedure but arbitrarily assume that the non-degree students cost three-fourths, or $3,092, of the cost of the degree students. Thus, degree student expenditures would still equal $26.6 million, and other student expenditures would equal $32.2 million ($3,092 x 10,414 = $32,200,963). This totals $59 million ($32.2 + $26.6 = $58.8). Thus, we estimate expenditures to be between $48 and $79 million in 1985 with $59 million being a reasonable estimate.

FORMAL POSTSECONDARY: APPRENTICESHIP PROGRAMS

Participants in apprenticeship programs were drawn from the *Vocational Resource Directory* along with hours of training, location, and skill area.[19] As indicated in the main text, apprentices' training is on the job or through courses offered by formal schools. The costs of the former would not be included in our estimates of expenditures. The costs of the latter are included under the costs of students enrolled in these schools. We did not, therefore, estimate separate expenditures for apprenticeship programs.

INFORMAL, POSTSECONDARY PROVIDERS

An estimate of private sector training in the Pittsburgh area can be made using the following:

Expenditures = (mean firm training expenditure per employee)
x (mean number of employees per firm) x (number of firms)

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[19] Western Pennsylvania Advanced Technology Center, 1984.

Information of this type is available from *Training* magazine[20] but on a national scale. The magazine's survey information can be translated into an estimate of Pittsburgh training by using information on the number and size of firms in the Pittsburgh area available from *County Business Patterns*.[21]

We note that the estimate that will be produced in this way is very rough.

We began with information from *Training* magazine on the average expenditures on formal training outside the firm by firm size. These data are shown in Table A.4, column A. This dollar amount does not include those costs incurred internal to the firm. *Training* magazine estimates outside spending to be 22.7 percent of total formal training costs; inside training is 68.2 percent of total costs; facilities expenditures are 9.1 percent of costs. We are not interested in the latter category as this is not included in any of our other estimates of educational expenditures. Thus, to get the total costs we are interested in we must multiply the data in column A by four (68.2 + 22.7 = 90.0, 90.9/22.7 = 4.00). The results are shown in column B. The numbers in column B represent total mean expenditures on training, both inside and out, by firm size.

We must now convert this into an average expenditure per employee. This is done by dividing the average total expenditure by the average number of employees in a firm. Without further information we would be forced to use the midpoint of the interval of firm size as the estimate of average employee. This, however, is known to be misleading because the data are not normally distributed, but skewed toward smaller sized firms. That is, within any interval of firm size, more firms are located below the midpoint than above. Thus, the interval midpoint is a poor estimator of the average number of employees.[22]

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[20] "Training Magazine's Industry Report 1988," *Training*, October 1988, pp. 31-60.

[21] Bureau of the Census, *County Business Patterns 1985 Pennsylvania*, U.S. Department of Commerce, Washington, D.C., August 1987.

[22] This is known from discussions with officials from the Bureau of the Census on other RAND work using this data set.

Analysis of the *County Business Patterns* data on the national level shows that the mean sizes of firms are smaller than the midpoints. We have chosen to use the results of an internal RAND analysis as our estimator of the interval mean number of employees. These values are shown in Table A.5, column A.

The average expenditure per employee per firm is calculated by dividing the average expenditures per firm (column A) by the average number of employees per firm (column B). The results are shown in column C. However, a problem arises because the data from *Training* magazine include only those firms with greater than 100 employees. Pittsburgh has many firms smaller than this. Therefore, we estimate the average expenditure per employee for these smaller firms to be equal to the weighted average of all firms--$353. (In fact, expenditures for these firms may be considerably smaller.)

We can now perform the necessary calculation. From other sources we know the number of firms by size in the Pittsburgh area. They are shown in column B of Table A.6. Multiplying across the rows we determine the total formal training expenditures for training by firm size (shown as column D). This total equals $386 million in 1988.

Table A.4

AVERAGE TOTAL FORMAL TRAINING EXPENDITURE
BY FIRM SIZE, 1988

Number of Employees	Average Outside Expenditure A	Average Total Expenditure B
100-499	$ 25,094	$ 100,376
500-999	48,871	195,484
1000-2499	136,809	547,236
2500-9999	304,733	1,218,932

SOURCE: "Training Magazine's Industry Report 1988," *Training*, October 1988, pp. 31-60.

Table A.5

AVERAGE FIRM EXPENDITURE PER EMPLOYEE

Number of Employees	Average Number of Employees A	Average Total Expenditure per Firm ($) B	Average Expenditure per Employee ($) C
1-19	10	N/A	353[a]
20-100	44	N/A	353[a]
100-499	220	100,376	456
500-999	650	195,484	301
1000-2499	1,375	547,236	398
2500-9999	3,125	1,218,932	390

SOURCES: "Training Magazine's Industry Report 1988," *Training*, October 1988, pp. 31-60. Bureau of the Census, *County Business Patterns 1985 Pennsylvania*, U.S. Department of Commerce, Washington, D.C., August 1987).

[a] Weighted average of all other categories.

To use this number with other estimates of expenditures in the document we must put it into the proper years and avoid double counting. All other expenditure figures are in 1985-1986 dollars. We deflate the 1988 dollars by 3 percent per year and arrive at an expenditure level of $351,899,000 for 1985.

Our understanding of this estimate is that it would include that portion of private sector spending that goes to tuition reimbursement at colleges and universities. This expenditure is already covered in college expenditures in other parts of the document. Thus, we must remove this portion to avoid double counting.

To determine the amount of private sector formal training expenditures given to schools we refer to Carnevalle and Goldstein. These authors estimate that 38 percent of training by all firms is done by outside sources.[23] Of outside training 63 percent is performed by

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[23] Carnevalle and Goldstein, p. 42.

Table A.6

TOTAL FORMAL TRAINING EXPENDITURES IN PMSA

Number of Employees	Average Number Employees A	Number Pittsburgh Firms B	Average Expenditure per Employee $ C	Total Expenditure per Firm $ D
1-19	10	41,010	353	144,765
20-100	44	4,722	353	73,342
100-499	220	930	456	93,298
500-999	650	84	301	16,435
1000-2499	1,375	32[a]	398	17,512
2500-9999	3,125	33[a]	390	40,219
Total	--	--	--	385,570

SOURCES: Pittsburgh Business Times, *1988 Book of Business Lists*, Pittsburgh Business Weekly Corporation, Pittsburgh, 1988. Bureau of the Census, *County Business Patterns 1985 Pennsylvania*, U.S. Department of Commerce, Washington, D.C., August 1987.

[a] Data for the number of firms in the Pittsburgh area show 65 firms in the 1,000 plus category. To determine how many of the 65 were greater than 2,500 we referred to the *1988 Book of Lists* which showed that there were 33 firms with more than 2,500 employees.

schools.[24] Thus, our estimate must be reduced by 24 percent (63 percent of 38 percent). This equals $267,433,000 in expenditures for 1985 and is equivalent to current expenditures, not instructional expenditures.

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[24] Carnevalle and Goldstein, p. 67.

Appendix B

DEGREE-GRANTING INSTITUTIONS IN PITTSBURGH AREA

STATE SYSTEM OF HIGHER EDUCATION

California University of Pennsylvania--Washington

STATE-RELATED UNIVERSITIES

Pennsylvania State University

1. McKeesport Campus--Allegheny
2. Fayette Campus--Fayette
3. New Kensington Campus--Westmoreland

University of Pittsburgh

1. Main Campus--Allegheny
2. Greensburgh--Westmoreland

STATE-AIDED COLLEGES

None

COMMUNITY COLLEGES

Community College of Allegheny--Allegheny

1. Allegheny Campus
2. Boyce Campus
3. College Center--North
4. South Campus

Westmoreland Community College--Westmoreland

PRIVATE COLLEGES, UNIVERSITIES, AND SEMINARIES

Carlow College--Allegheny

Carnegie Mellon--Allegheny

Chatham College--Allegheny

Duquesne University--Allegheny

Laroche College--Allegheny

Pittsburgh Theological Seminary--Allegheny

Point Park College--Allegheny
Reformed Presbyterian Theological Seminary--Allegheny
Robert Morris College, Pittsburgh Center--Allegheny
Washington and Jefferson College--Washington
St. Vincent College--Westmoreland
Seton Hill College--Westmoreland

PRIVATE JUNIOR COLLEGES

None.

SPECIALIZED ASSOCIATE-DEGREE-GRANTING INSTITUTIONS

Art Institute of Pittsburgh--Allegheny
Computer Systems Institute--Allegheny
Duff's Business Institute--Allegheny
Dean Institute of Technology--Allegheny
Electronic Institutes, Pittsburgh--Allegheny
ICM School of Business--Allegheny
Median School--Allegheny
Monroeville School of Business--Allegheny
Penn Technical Institute--Allegheny
Pittsburgh Technical Institute--Allegheny
Pittsburgh Beauty Academy--Allegheny
Pittsburgh Institute of Aeronautics--Allegheny
Triangle Institute of Technology, Pittsburgh--Allegheny
Penn Commercial, Inc.--Washington
FPM Data School--Westmoreland
New Kensington Commercial Schools--Westmoreland
Triangle Institute of Technology, Greensburgh Center--Westmoreland